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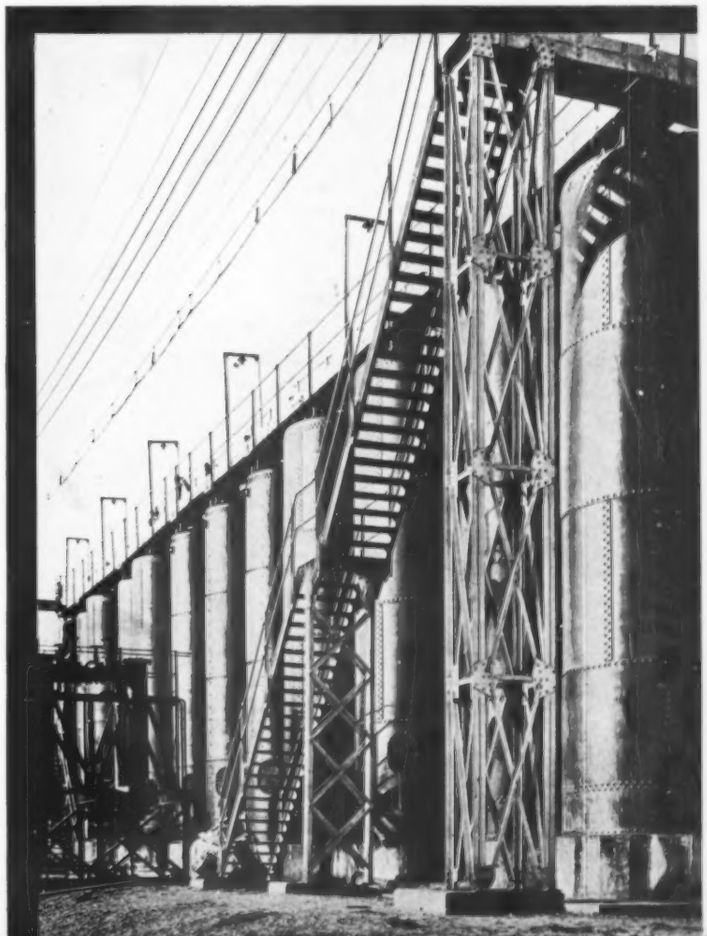
WORLD PETROLEUM

Colombia's New Petroleum Law Reviewed • Roumanian Minister Demands Action • Colossus of America's Oil Industry • Purchasing Oilfield Equipment for Overseas • Soviets and Chinese Kerosene Market • Mexican Gasoline Import Situation •



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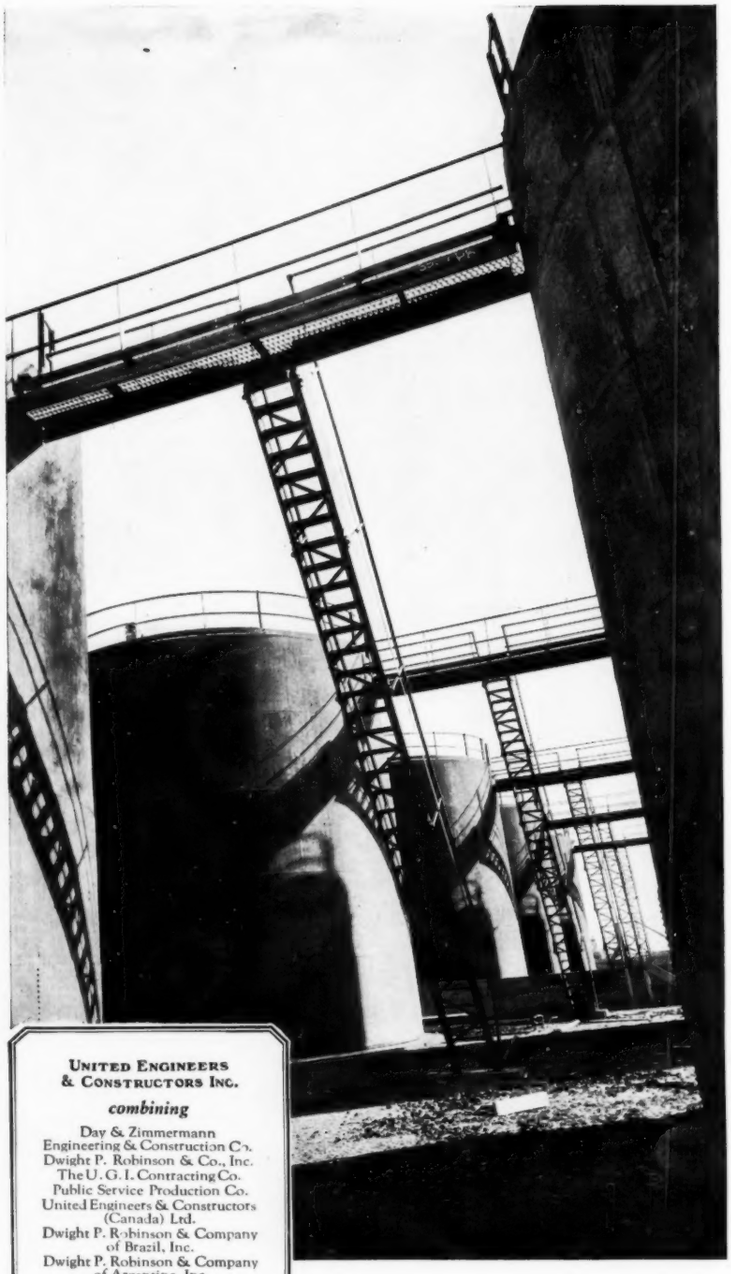

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APRIL
1931

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Executive-Editor, T. Orchard Lisle

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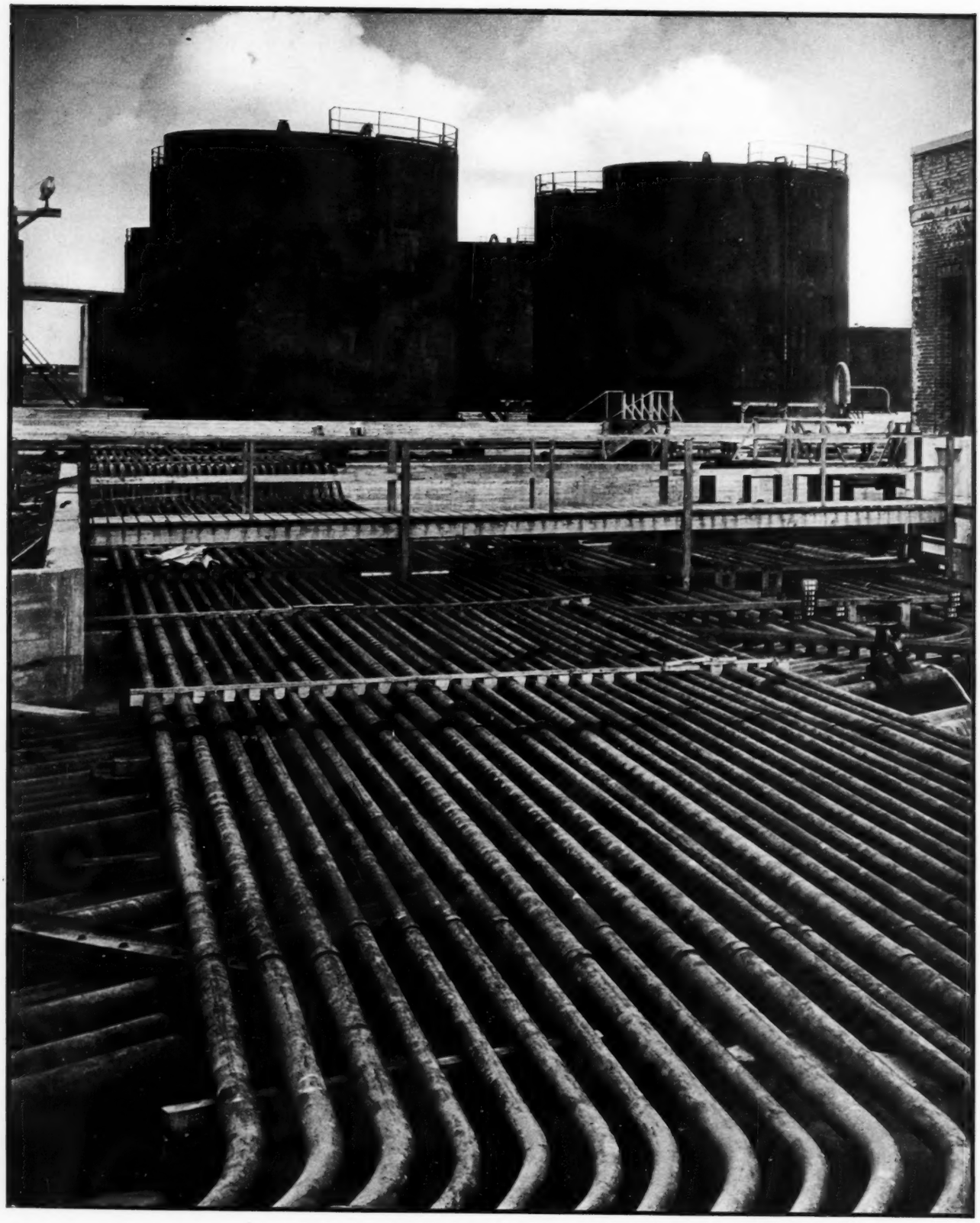

Pipe Conduit and Oil Piping, Gulf Refinery, Staten Island, N. Y. M. Rosenfeld

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PETROLEUM

Exploitation Laws

SEVERAL leading petroleum producing countries have recently passed new and important laws affecting the development of their oil resources. While the main intent has been a liberal one there is a belief among practical oil men that some onerous conditions have been imposed. Nations desiring exploitation of their oil fields would do well to bear in mind that there has been a great and fundamental change in underlying conditions. Present overproduction has slackened the race for oil. Great new reserves in many parts of the world have removed apprehension about supplies for many years. Moreover, the threat of impaired access to the great American market will cause great care to be exercised in development work, particularly in South America. Countries whose people feel it necessary to impose complex and uneconomic conditions must be content to leave the exploitation of their natural resources of this sort to later generations.

▼

Engineering Advance

OILFIELD engineering has lately made such remarkable advances, that what a year or two ago was considered technique of the highest order only to be undertaken with extreme caution, is now regarded as everyday work. The views on deep well drilling of an important oil executive, and with special reference to a 10,000 foot well nearly completed are of particular interest. He says: "As regards our well now drilling at 9,700 feet in the San Joaquin Valley, although at the moment this well may actually be the deepest hole in the world, it is still drilling and if everything goes satisfactorily it may reach a five-figure depth within the not distant future. Whatever happens to it, however, one thing is certain: that possibly even before the article could be published somebody else will have exceeded the depth to which our well eventually penetrates.

"The development of drilling technique has been so amazingly rapid in the last year or two that, to my mind, deep drilling records have lost their interest for the public, and to emphasize them too much would probably result in this type of work being put in much the same class as endurance flight records, etc. As you know, deep drilling in the modern sense has practically been developed in California. For example, in the Kettleman Hills every well which is spudded starts out for an objective which is around the eight thousand foot level, and possibly substantially deeper."

▼

Travelling Light

THE great and powerful Standard Oil Company of New Jersey, well intrenched in vast financial resources, has not been too proud to make public the recent dictum of its president that overhead expense must be cut ten per cent. Other major oil company heads would do well to ponder this fact. The elder Rockefeller was once asked to give the secret of his success in a few words and replied, "We never deceived ourselves." More than one great company is top heavy today with an unwieldly executive organization burdened with a weight of administrative detail, the necessity of which is doubtful but deceptive. He who travels light travels far.

▼

Low Prices and Taxation

ELSEWHERE in this issue our British financial correspondent points out that as a result of a recent cut in the price of motor spirit the Chancellor of the Exchequer is giving consideration to increasing the existing 8c per gallon tax. This bears out the contention that WORLD PETROLEUM has consistently put forward, that whenever an abnormally low price for petrol exists, it offers a standing invitation to Governments and individual States to take full advantage of the opportunity to increase their revenue by means of higher sales taxes on gasoline. The probable increase in gasoline taxes in Great Britain is likely to meet with strenuous opposition from users of spirit for commercial transportation, as it is calculated to hinder trade development.

This brings up the point, that in 1908 when a tax was first imposed upon petrol in England, the present Editor of WORLD PETROLEUM personally interviewed Lloyd George, then Chancellor of the Exchequer and, unaided, successfully urged him to grant a rebate of the tax on all petrol used for motorcraft, on the grounds that neither pleasure boats nor fishing vessels used the roads and that a tax would seriously retard development of a (then) young industry.

Russia and Chinese Kerosene Market

Soviet Authorities Unlikely to Sanction "Unofficial" Endeavors by Over-Zealous Trade Representative to Undersell American and British Companies in the Orient.

IN the not too distant future international oil interests and automobile manufacturers operating in the vast republic of China may find a way of building, in collaboration with the Government, a great network of modern roads. Then there will develop a tremendous market for motor spirit, lubricants, trucks, motorcars, tires and curb pumps. Until that time arrives kerosene will remain the only petroleum product marketable in substantial quantities in that oriental country of 400,000,000 people. Today China is a very sick petroleum market. Low priced silver is the disturbing element mainly responsible for a drop of about 30 per cent in the sales of kerosene last year.

With the petroleum producing, refining, and distributing map of the world facing radical changes, the opening of China and its neighbor India to huge sales of gasoline cannot be brought about too rapidly for the future stability and prosperity of the oil industry.

Recently China has stepped into the limelight as the objective of a rumored market invasion by the Soviets as one important outlet for the rapidly increasing production of Russian oil. Negotiations for contracts to supply about 750,000 bbl. annually, or about 15 per cent of China's requirements are reported to be under way. In fact, it has just been stated in the daily press that the Kwangwha Petroleum Company—a domestic merchandising concern with a distributing system throughout the country—has agreed to import 71,430 bbl. monthly from the Black Sea district. The negotiated price, it is understood, would enable the kerosene to be sold under the present retail market.

There is no smoke without fire. The writer has been given to understand that this furore might have been created by the actions of an over-enthusiastic envoy, or trade representative, from Soviet Russia, unfamiliar with the delicate phases of the Chinese oil business. This man, P. A. Libanoff, in the course of his political work apparently has been engaged in negotiations for the sale of kerosene to Chinese independents, probably on his own initiative, and under no circumstances is it likely that the majority of the Soviet oil industry executive board will endorse such action. Neither is Moscow likely to endorse such a contract which, if consummated, is bound to disturb the already unfavorable kerosene marketing conditions in China.

Unquestionably, Russia would welcome a tangible share in the Far Eastern petroleum market if it was economically and commercially feasible. A study of the map and tanker freight rates, however, reveals the impracticability of endeavoring to ship large supplies of oil such a great distance via the Suez canal with its tolls, and into a falling market where three powerful competitors are soundly entrenched—two for nearly half a century.

Secondly, even were it possible and profitable, the movement would be regarded as an unfriendly act by at least one of the Soviet's important customers, and possibly would result in Russia losing more than was gained.

Thirdly, China demands a kerosene of very high grade, due to the country's early education—back in the days when *Mei Foo* (Standard Oil Company of New York) flooded the land with lamps having specially constructed chimneys that belched smoke and stench whenever inferior grades of oil were burned. Russia's kerosene falls far short of the excellent quality to which the Chinese are accustomed. In fact, the New York Standard was obliged to erect a special treating plant at Batoum to render the Soviet oil, which it purchases, suitable for the Indian kerosene markets. None of this kerosene is shipped by Socony to China, although it sends over 1,200,000 bbl. to the Indian market, which is about the longest haul practical. For the Soviets to endeavor to import untreated kerosene into the sick Oriental sales territory at a time when the supply of high-grade kerosene already exceeds the demand is obviously unwise.

The demand for kerosene in Russia itself as fuel for the increasing number of tractors used in agriculture, limits the increase in any shipments abroad, especially as there already exists a domestic shortage caused by heavy exports to date that were essential to meet financial obligations.

Even were it practical for the Soviets to export a large supply of high-grade kerosene to China, their present trade arrangements with the New York Standard, which company now enjoys 50 per cent of the entire Chinese oil business, would be a sufficient inducement to stay their hand. The quantity of various petroleum products purchased by the New York Company far exceeds in value what the Soviets could hope to sell in the Orient, apart from heavy Vacuum Oil Company purchases. It is hardly likely that the American company would stand by idly and see its 40 years' work jeopardized. Hence, it is not difficult to understand why it is practically certain that the Soviet authorities in Moscow will not endorse the "unofficial" act of its enterprising "red salesman" in China. H. H. Kung, Minister of Industries of the Chinese Republic, is reported to have issued a declaration that dumping large quantities of Russian kerosene would be illegal, and no Chinese company would be permitted to enter into such a contract, as there exists no commercial or diplomatic relations with Russia.

It might be mentioned that when Russia completes a refinery at Khabarovsk —about two years hence—for refining Sakhalin crude, the situation may entirely change.

Official figures for 1930 total imports of kerosene into China are not yet available, but according to marketing sources they are 30 per cent below the previous year. Imports of kerosene shipped from the United States for 1930, however, amounted to 3,172,393 bbl., compared with 4,000,000 bbl. in 1929 and 4,849,729 bbl. in 1928. Hence, in three years America's annual kerosene business with China has fallen off to the extent of 1,677,366 bbl. For an outsider to force its way in at this critical time and shoot holes in the price structure would be very serious, particularly

(Continued on page 293)

Major Features New Colombian Oil Bill

Petroleum Bill Passed Following Three Years Efforts. Designed to Attract Foreign Capital Under Acceptable Conditions of Exploration and Operation.

OWING to unfavorable and imperfect laws Colombia, a country rich in petroleum resources, has had its oil development restricted to the operations of one company functioning under an old grant. Since his election President Enrique Olaya Herrera has labored unceasingly for a new oil law which would prove effective in attracting outside capital and bring about sufficient production to make Colombia one of the major oil countries of the world. The law just passed, while not considered ideal by some international oil authorities, stands out as a sincere attempt in the right direction to put Colombia's petroleum industry on a sound basis. Many international oil authorities believe further changes are essential to make the law fully workable and attractive.

AFTER three years of discussion the Colombian Congress has passed and President Olaya has signed a new petroleum law (No. 37 of 1931). It would have gone into effect 60 days from March 4, but an unimportant clerical error has made republication necessary, thus temporarily delaying its functioning.

The new law relates especially to the exploitation of petroleum deposits on Government lands (baldios, or the public domain), and to all former public lands that have passed into private hands since 1873, in which year a law was passed reserving subsurface mineral rights to the Government. Owners in fee whose title antedates 1873 retain their subsurface rights, subject, however, to the Government's right of eminent domain.

Any person may apply for a permit to explore for oil on a designated tract of Government land of not less than 5,000, nor more than 50,000 hectares (1 hectare = 2.47 acres); in certain eastern districts the permit may cover 100,000 or 200,000 hectares. Permits to explore may run for a maximum period of six years, and are subject to an annual rent charge increasing from 10 cents to 50 cents per hectare. Individuals and corporations owning rights to private subsoil can drill on their lands after giving notice to the Government, and after complying with other requirements to substantiate their title to the said subsoil rights.

Any person engaged in producing oil, whether on public or private lands, has the right to construct pipe lines for the service of his products. Persons not engaged in production may also construct pipe lines subject to governmental regulation as common carriers. The Government will have preferential rights for the transportation of its oil over any pipe line, this preference not to exceed 20 per cent of the pipe line's capacity.

When oil is found on Federal lands, the Government will be entitled to a royalty of 11 per cent of the gross production from all wells within 100 kilometers of the nearest sea port; this royalty progressively diminishes to 2 per cent on oils from wells more than 900 km. from the sea. Oil produced from lands owned in fee pays a production tax of eight per cent in the first 100 km. zone, diminishing to one per cent beyond 900 km. Privately owned oil thus is apparently taxed at a lower rate than oil from public lands. The tax or royalty may be paid in cash or in kind, at the well or at the port, as the Government may elect. In either case the concessionaire or private owner must bear the cost of transporting the Government's oil to the port of shipment, irrespective of distance. The oil producer must also provide, at his own risk, free storage for the Government's oil for a maximum period of four months when desired.

After oil has been found the concessionaire exploiting oil deposits on public land will have the right of producing oil from his concession for a period of 30 years, with the privelege of extending this period for an additional term of 10 years, if at that time he is willing to abide by the laws and regulations which may then be in force. When the concession has finally expired the government acquires, without cost, full title to all permanent improvements, and may take over movable property pertaining to the concession at a fair valuation. The Government also has the right to recapture, without cost, all contracted pipe lines at the expiration of 30 years from the date when the line was put into service.

During the life of his concession to produce oil the concessionaire must operate all his wells at not less than 25 per cent of their maximum capacity. If he chooses to operate at a lesser rate or to shut down altogether—with prior consent from the Government—the Government will still be entitled to its royalty, calculated on the minimum rate of production.

Concessionaires who recover gasoline from natural gas will pay a royalty of 1/30 of this product unless it is again mixed with the crude petroleum. Natural gas sold or used by the concessionaire for industrial purposes is taxed at the rate of five cents per 10,000 cu. ft. Ownership of all helium that may occur in natural gas is reserved to the Government.

The refining of crude petroleum within the national territory is declared to be free. The Government may, however, set apart certain lands or locations in

which it will issue permits for the construction of refineries for fuel supply stations; such permits will not run for longer than 30 years. The Government may also construct its own refineries for treating the crude oil that it receives in royalties or as taxes; but no government oil is to be sold at a price less than that offered by the producer who pays the tax or royalty.

All foreign companies proposing to explore for oil or engage in production must organize a subsidiary domiciled in Bogota and subjected to Colombian laws and regulations. At least 75 per cent of the personnel employed in all oil enterprises must be native Colombians and will enjoy the same salaries and conditions of work as "imported" employees of the same grade. All persons engaged in the petroleum industry, whether operating on public or private land, are obligated to turn over to the Government all data of scientific, technical, economic, or statistical character which they may acquire and which is deemed to be indispensable for the geological or geophysical study of the country. No person is allowed to take aerial photographs of any terrain without the permission of the Government, which will be entitled to one copy of all such photographs.

Persons applying for permits to explore for oil on public land must post a bond of $1.00 (Colombian gold standard) for each hectare embraced in the proposed concession; but in no case will the bond be for less than $25,000. Concessionaires who undertake the construction of pipe lines will post a bond of $50 for each kilometer of main line. These bonds are to guarantee fulfillment of obligations, and the payment of fines for infractions of regulations. All contracts and permits are subject to cancellation for any one of seven specified reasons. Differences of opinion as to meaning or application of contracts between the Government and the concessionaire are to be settled by arbitration.

In view of the uncertainty of land titles in Colombia and the difficulty of distinguishing public from private lands the Government does not guarantee title to the land and subsoil for which it may issue concessions for exploration and production of oil. Notice of all applications are to be published and parties claiming interest in the lands affected are given 60 days in which to file opposition. If opposition develops, the matter is sent direct to the Supreme Court for advisory judgment; if this is favorable to the applicant for the concession, the opposer is left to seek his remedy in the common law; if favorable to the opposer the Government will not issue the concession until, i. e., if it chooses to do so, it establishes under common law its title to such subsoil. And, in this case the Government also reserves the right to attack the private title should it appear that the latter is invalid. On the other hand parties proposing to drill on what is claimed as private land must submit proof of private ownership before starting operations, otherwise a heavy penalty will be incurred.

When a petroliferous structure is found to extend over two or more concessions belonging to two or more different interests who are unable to agree the Government reserves the right to oblige all the parties to put into effect a co-operative plan of development, under conditions which the Government will define and regulate. This obligation applies to operators on either public or private lands. Neither private owners nor public concessionaires are allowed to drill within 100 meters of the boundaries of their respective claims.

If no oil is found within the six year period of exploration, or if oil wells that have been opened cease to produce within 20 years, the operator may remove his equipment and his bond will be returned to him.

Part of the royalties and taxes accruing to the Government from the oil industry will be turned back to the departments or districts in which they originate; but no department nor municipality is allowed to tax the industry in any way for its own account.

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Impressions of the Law's Effect

REPRESENTATIVES of oil companies and other men familiar with conditions in Colombia who have been consulted by WORLD PETROLEUM have expressed the opinion that the new petroleum law represents a long step in advance over the previous state of affairs, or even over the original draft of the law as first presented three years ago. It is agreed that the Colombian Congress, prompted by President Olaya, has made an earnest effort to produce a petroleum law that will be a real help in developing the country's resources to the advantage of the nation and at the same time give the needed incentive to foreign capital. Much praise is given to President Olaya for his intelligent handling of the legislative situation in the last stages of the bill, and to the energy and cooperative spirit he has put behind the bill in its various stages. Many of its most valuable features are said to bear the impress of his personal influence. Oil company representatives point out, however, certain deficiencies and imperfections which, in their opinion, could well be modified. No doubt this will be recognized by the Colombian Congress, and at the earliest possible time adjustments satisfactory and of mutual advantage to both foreign oil companies and Colombia will be made.

As the law stands, it incorporates several basic points which may prove a drawback to any extensive exploitation, commercial production and exportation of petroleum. The distinction of private rights and Government rights as far as subsoil is concerned is a matter of great importance, due to the title situation in Colombia. On the question of taxation, conditions in Colombia cannot be compared with those in the United States.

In the first place, it is said that the share of the oil claimed by the Government in the form of royalties or taxes will probably be something of an obstacle to further development of Colombian oil fields, especially as most of the petroleum deposits lie in the interior and will have to bear a considerable expense to get the oil to port. The Government shares in none of this cost of transportation, as it may exercise its option of collecting its royalty or the production tax at the port, irrespective of the location of the wells. The economic effect will be to make the value of a barrel of oil in the interior considerably less than in neighboring South American countries; oil operators will be therefore less keen to enter Colombian fields so long as cheaper sources of equal quality are accessible at other strategic points.

Today any consideration of new exploitation faces the fact that new supplies of crude oil are not immediately needed due to excessive production in major oil countries. Consequently greater inducements must necessarily be offered if active operation is to be reasonably assured by any country wishing early development of its natural resources. The handicap imposed on new capital entering Colombian public lands appears to these observers to be all the greater when the new Colombian law is compared with the Venezuelan petroleum law, which does not require the oil companies to pay

(Continued on page 295)

Arriving at the Creole Petroleum Corporation's Camp at Quire Quire.

Inspecting Oil Properties By Air

Executive Use of Airplanes, Particularly in Tropical Countries Where a Fortnight of Flying Saves Months in Times. Personal Experiences in Venezuela and Colombia.

By E. J. Sadler.

Vice-President of Production Standard Oil Company of N. J.

WHILE a layman's viewpoint on airplane transportation may be of little value from an aviation standpoint, it possesses on the other hand, some value from a business standpoint. My personal observation from a considerable use of planes in connection with my duties in oilfields and other branches of the petroleum industry is that they have a very real value in case of emergency, and as a means of saving time for men whose services are particularly valuable to their company. The airplane has the advantage of fast travel, coupled with direct route. For example, leaving New York in the evening, it is practical to reach almost any point of the United States east of the Rocky Mountains within 24 hours, riding on the train at night and taking the plane at daylight the following morning.

My own recent experiences, together with those of other company officials, in the northern part of South America, where there are few railroads or automobile roads, clearly demonstrated that by using planes we were able to do better work than by the use of other transportation facilities in certainly not more than 25 per cent of the time.

Our company limits the use of airplanes to daylight flying in weather with good visibility. We also endeavor to have the best of equipment and the best of flying personnel. Without these limitations I would not favor the use of planes.

In our recent trip we covered practically all oil fields in Venezuela and Colombia, getting a much better impression of the generalities from the air than would be possible on the ground. At the same time there was no difficulty in finding either a field, or water where an amphibian could land, in any part of the countries in question where we were particularly interested in making a landing.

An example in the saving of time is the frequent necessity of traveling from fields in Western Venezuela to fields in Eastern Venezuela, and vice versa. Previous to the use of airplanes, the trip took ten days and could only be made on infrequent steamer days. More recently automobile trips can be made at certain seasons of the year, covering the distance of about 600 miles in approximately six days—By the use of the plane six hours is the average flying time from Western to Eastern Venezuela, with an opportunity to stop at Carácas, the capital, en route, for the transaction of any necessary business, all the major oil companies operating in Venezuela having offices in Carácas.

Multi-motor planes have been extremely useful in inspection of pipeline construction, as it is possible to fly within 150 feet or 200 feet of the ground and get an excellent idea of construction progress. At pump stations, one can circle around, take photographs when desired, and obtain ample opportunity to note construction progress. We find that by looking around in average country it is not difficult to locate some field that can be used for landing pur-

Cartagena

The flying field at Maturin is one of the finest in Venezuela.

poses within reasonable distance of almost any pump station.

It is my feeling that by utilizing airplane transportation wherever practical, many business and operating matters are attended to promptly, that otherwise would be either postponed or neglected. I also feel that there is a real value in the possibility of making trips by plane with comfort as compared with making trips by rail, which form of travel frequently involves a great deal of discomfort, particularly in the summer time. At the end of a 500-mile trip the man who has gone by plane arrives in much better condition to transact business, in addition to saving valuable time. It would seem that the use of planes in trips from the office to the fields and refineries will materially increase an executive's capacity to handle business.

A few remarks concerning our recent flight over Venezuela and Colombia may be in order as an illustration of the advantages of airplane travel.

When we arrived at La Guaira, Venezuela, which is the seaport for Carácas, the capital, the company's Sikorsky plane was waiting; but we did not start on any extended trip until the next day. About seven o'clock in the morning our ship took off from La Guaira and flew over the Paraguana Peninsula, stopping at Dabajuro for lunch, after which we flew to Maracaibo, arriving about three o'clock.

Orderly drilling of Lake Maracaibo wells is best seen from the air.

The next day about 7 a.m. we set off for Colombia. It was not possible to use our own plane as permission for it to leave the country had not been secured in time, so we left in the Pan-American Airway's Sikorsky, flying almost airline for Cape San Juan de Guia, thence passing over Santa Marta inside the high mountains on the point. We landed at Barranquilla about nine o'clock, where a hydroplane was ready to start up the river to Barranca Bermeja, where the Tropical Oil Company has its headquarters and refinery. Normally this trip by river steamer takes anywhere from several days to two weeks, in accordance with the season of the year, and the depth of the water. We took off at 10:25 a.m. and landed at the destination for lunch, about two o'clock.

After two days at Barranca Bermeja we took off in the same hydroplane, at 8:55 a.m., and flew to the Andian Pipe Line pump station at Chingalé, arriving at 9:40. Less than an hour later we again took off and reached Cartagena at one o'clock. After lunch we flew over the terminal at Mamamao and back to Cartagena. On the afternoon of the twentieth of January at 4:25 we left Cartagena aboard the Pan-American plane arriving at Barranquilla at 5:05, where we spent the night.

Shortly after 8:30 a.m. we took off,

Route over Venezuela and Colombia followed by the author.

skirting the Goajira Peninsula. We proceeded to Maracaibo, landing at 11:20 a. m. After landing we took the Creole plane and proceeded to Lagunillas, arriving just before one o'clock. After lunch we visited the oilfields there, and at 3:30 we flew over the Mene Grande oilfields, turning back at 4 p.m., landing at the (Creole) main camp at Punta de Leiva at 5 o'clock.

On the morning of January 22 we flew over the Concepcion and La Paz fields, turned back south to Totuma and Macoa, and then to Punta de Leiva, arriving at 10:45 a.m.

At 7:25 a.m. the next day our plane started for Maracay, near which city General Juan Vincente Gomez has his ranch. En route we landed at Dabajuro and inspected the oilfields there.

Taking off again at 12:25 we reached Mamon half an hour later, made a circuit of about a dozen miles and then landed, although the increasing winds delayed us a little. At 1:40 we took off to finish the 200 mile balance of the trip to Maracay. Bucking the head wind we skirted the coast to Puerto Cabello, passing it at 4:10 p.m. Climbing to 6500 feet we crossed the mountains, landing at the Maracay airport, at 4:35.

Examining a seepage at Pedernales.

At 11 a.m. the following day we left by automobile, going over the excellent concrete road through the mountains to Caracas, arranging for our plane to proceed to La Guaira, and pick us up to take us to Calabozo.

On January 29 we left Calabozo at 10:20 a.m. and headed for Eastern Venezuela, via Barcelona, following the railroad out to Orocual and then into Quiriquire, where our company has its Eastern Venezuelan head camp, landing a little after 2 p.m.

On the morning of January 31 we flew over the eastern part of the Gulf of Cariaco, crossing the mountains to the north coast and following the ranges until we were opposite the Gulf of Paria. We again crossed the mountains and flew to Guanoco and Caripito, returning to Quiriquire at 10:45 a.m. A day was spent overhauling the plane and further flights were made, including Orinoco delta.

One of the things that impressed us most in flying over Venezuela was the extent of its excellent road system a large part of which traverses difficult mountainous country in linking up the important centers of the country. Even taking into consideration, however, the possibility of utilizing the existing roads, it would have taken us a considerably longer time to cover by automobile the same country that we did by airplane, due to the great distances and the mountainous character of the country separating some of these fields.

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Roumanian Minister Demands Action

Declares He Will Save Domestic Oil Business by Legislation If Petroleum Companies Do Not Promptly Arrive at Own Solution of Current Difficulties

By E. Margulius

FACED with failure of the Roumanian petroleum industry to arrive at a satisfactory understanding within itself regardless of reiterated warnings, Mihil Manoilescu, Minister of Industry and Commerce, decided to make a last attempt to bridge the chasm existing between the various companies before taking the matter into his own hands.

On February 17 he summoned executives of all oil companies operating in Roumania to the Ministry in Bucharest and gave them one week to formulate tangible proposals for a practical solution of the present crisis. Minister Manoilescu bluntly declared that if, at the termination of seven days, nothing had been done he would take action by legislation. Such legislation would be drafted according to his own views without asking for, or taking into consideration, the opinions and desires of the interested parties. He declared that he had decided to save the oil industry in spite of itself. The salvation, in his opinion, rests almost entirely on the reorganization of the interior market, and on some contingency plan to put an end to existing cut-throat competition between refiners.

As a result of Mr. Manoilescu's ultimatum, the Distributia group (Astra-Româna, Româno-Americana and Steaua-Româna) on March 23, initiated a plan for a new Cartel for the domestic market. Their proposal is made on the following lines: The refining companies are to be divided into three groups according to their importance. The old agreement, which lapsed on the 31st of December 1930, gave to the small refiners (No. 3 in the group) a protection quota, now abolished, and full liberty to refine to the maximum of their capacity, and to dispose of their products. The new plan obligates them to restrict their output to their average for the years 1928 to 1930, and to turn over the whole of that production to the seven largest oil companies in Roumania, who form No. 1 in the group. The small refiners will receive for their domestic quotas the prices realized from the sales of petroleum products in Roumania. For the balance they will receive from the

Comparative Schedule of Companies with a Production Over 700 Bbl. Per Day

Name of Company	Beginning 1930			End 1930					
	Wells in Drilling	Producing Wells	Daily Production in bbl.	Wells in Drilling	Producing Wells	Daily Production in bbl.	Production 1929 bbl.	Production 1930 bbl.	Meters Drilled 1930
Astra-Romana	16	154	20,552	9	128	21,920	5,996,604	7,238,294	47,206
Steaua-Romana	49	407	15,162	14	167	19,243	5,540,549	5,561,871	40,038
Concordia	28	147	10,430	8	139	19,446	4,720,933	4,166,022	32,309
Unirea (Phoenix)	23	117	11,213	12	114	15,925	3,381,098	6,393,751	30,192
Creditul Minier	19	75	12,992	8	64	15,631	3,032,729	4,231,936	18,497
Romano-Americana	22	96	5,712	7	69	15,120	2,986,480	3,196,851	26,141
Columbia	13	66	3,416	6	28	8,512	1,200,430	2,208,038	10,425
I. R. D. P.	6	27	3,724	9	19	8,372	1,374,275	2,056,068	11,086
Romano-Africana	6	10	315	5	13	1,631	242,032	918,736	5,990
Sondajul	9	6	1,631	4	15	2,940	235,851	829,311	9,097
Parahova	4	16	1,981	4	20	3,080	344,890	741,776	4,717
Dacia-Romana	1	21	791	1	17	1,603	210,861	554,841	3,713
Petrolul Romanesc	14	23	2,128	6	20	777	797,622	464,890	2,306
Sondrum	2	7	1,274	2	9	1,050	486,906	422,317	3,496
Romano-Belgiana	8	54	1,120	6	52	917	404,971	415,401	3,669
Starnaphta	6	11	1,120	4	15	1,057	314,265	306,481	3,069

seven big companies, f. o. b. Constanta prices, plus 15 per cent.

One of the stumbling blocks in the way of the conclusion of the Cartel is the opposition of some of the refining companies of group No. 2, which have no production of their own. They contend that they dare not face again any recurrence of the situation existing last year during the period of restriction of production. They then had to pay a few thousand lei more per car for crude than they could realize from the sale of petroleum products. As a condition for their adhesion to the proposed Cartel, they stipulate that their supply of crude be guaranteed at a price low enough to leave them a small margin of profit.

As a corollary to the above, producers without refineries are afraid of possible competition from big refining companies as sellers on the crude market. Consequently they request a guarantee of preferential purchase of their production by the group of refiners that have no producing facilities. A cooperation of these two groups will wipe away the most serious source of opposition to the proposal.

The general opinion in the Roumanian industry is that the Cartel may be established shortly—perhaps by the time this appears in print, which will mean an important step forward. Though the actual effects of the Cartel will be slow to materialize, most of the refineries having contracted for important quantities of products in advance, the market for crude has already discounted the renewal of the cartel. Bustenari crude has risen by about 30 per cent to 6,500—7,000 lei per r.r. tank car, while the lower grade oil (Moreni paraffin base) has risen from 2,500 to 3,200 lei per car.

Production from the Roumanian fields (360,000 bbl.) now approximates 1,800 cars per day. The drop of about 200 cars (14,000 bbl.) per day since the end of January is due, on the one hand, to a self-imposed restriction of some of the big producers.

Drilling activity in the oil fields has been very considerably reduced in the last few months. As a matter of fact, the question is being raised as to whether current drilling will be sufficient to maintain production to meet the demand for Roumanian products.

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Import Restriction Fight Status

As reported in our last issue the Congress of the United States adjourned without passing a tariff or placing an embargo on oil. Agitation for these measures continues in the mid-continent area where it has been difficult for producers to grasp the fundamental changes which have placed them at a permanent disadvantage in the domestic market.

While it may be expected that the campaign will be renewed with fresh vigor when the new congress convenes in December the advocates of protection will have to contend with a change in the political complexion of Congress and the fact that another presidential campaign will be in the offing.

In an effort to allay criticism meanwhile the administration has been endeavoring to bring about a voluntary limitation of imports. On this subject Ray Lyman Wilbur, Secretary of the Interior, writes WORLD PETROLEUM as follows:

"Working through Secretary Lamont, there has been an endeavor made to bring the individual importing oil companies to harmonize imports with the proration plans of the oil producing States. This, of course, is on a voluntary basis and is to be carried out by the companies concerned in accordance with their own plans and their own ideas as to the best way to be of service to the public and to the oil industry in general. No attempt has been made to secure hard and fast agreements or group agreements. This has been a call upon the voluntary spirit of the American business men connected with the oil industry."

While the administration's efforts have been well received by the principal oil companies affected, a new complexion has been put on the proposal by the vigorous opposition of Senator Borah, chairman of the powerful Foreign Relations committee and one of the strongest men in the Senate. Senator Borah has sharply criticized the administration plan on the ground that it is a violation of the Sherman and Clayton acts. Since his declaration there have been no further announcements by the Administration, which from bitter experience knows the cost of Senator Borah's opposition.

A conference of the governor representatives from the principal oil producing States was held on March 9th at Texarkana, and was marked by the proposal of Governor Murray of Oklahoma that the States concerned bar corporations importing oil into this country.

In order to have the data ready for the next Congress the United States Tariff Commission has begun its investigation on the cost of crude and refined oils from other countries entering the United States.

The wide divergence of opinion among leaders in the industry as to the proper course to be followed makes it quite subjective to the whims of legislative bodies. Much of the proposed legislation has been inspired by interests within the industry determined to punish those who do not agree with the particular remedies they propose.

The fact that many of these differences of opinion are being aired through the daily press is attracting a large amount of unfavorable attention towards the industry and there are quite a few observers who believe that if the present situation is prolonged the industry will inevitably drift into governmental control.

Mexican Minister Discusses Oil Industry

Minister Saenz Outlines Government's Attitude Toward Development of Home Markets and Export Business in Broad Review of Mexican Situation.

MEXICO CITY.

As all oil companies operating in Mexico are now conforming with the provisions of the petroleum law, one of the greatest problems that confronted the Mexican government has been removed, asserts Aaron Saenz, Minister of Industry, Commerce and Labor, in a statement concerning the situation of the Mexican petroleum industry. Minister Saenz declares that, as a result of the solution of this problem, the government is now able to concentrate upon the adjustment of other matters concerning the industry.

Minister Saenz's statement says, in part, as follows:

"During the first year of the presidential term of President Pascual Ortiz Rubio, who took office for six years on February 5, 1930, the handling of applications for petroleum concessions demanded preferred attention. There was a considerable number of applications for concession before the Petroleum Department, and the administration desired to act upon all pending applications in the shortest possible time, in order to clear the way for the development of new projects. This task, although undertaken with great enthusiasm and good will, was not without difficulties owing to the necessity of verifying claims made and presented as 'positive facts.' Nevertheless, 125 concessions were allowed, many of them being of a most delicate nature, which, added to those previously granted, gave a total of 1,186 concessions, with a total area of 12,491,661 hectareas.

"Taking into account that all petroleum companies operating in Mexico have been placed, without any exception, under our law, reasons for controversy and friction have disappeared. Uncertainties under which the industry operated regarding rights and obligations no longer exist, so attention now can be given to other problems closely related to national economy. Measures for insuring conservation and the better utilization of our petroleum resources; dispositions tending to secure an adequate domestic supply, and the creation of national petroleum reserves to take care of the future Mexican industries, railways, national defense, etc.

"Although these measures are already covered to some extent in our petroleum law, it has been necessary to study them more widely and use the experience obtained not only in our country, but abroad—especially in the United States. The respective studies have been completed by the Petroleum Department. Their realization has been initiated with a decree that authorizes the unit operation of oil fields. The Ministry hopes that exploitation will be effected upon a sounder and more reasonable basis.

"Within the program of nationalism that our Administration has initiated, the Petroleum Department has almost completed a book that we may consider useful, not only for Mexico, but for all the Spanish speaking countries, as well as for those who have any technical, industrial, or mercantile relations with them. The book will be published shortly in English and Spanish, and comprises a 7,000 word glossary of oil terms."

In connection with the program for the industrialization of Mexico, Minister Saenz asserts that advantage must be taken on a big scale of national petroleum products. He points to the devastations made in the forests of the Republic by the universal use of wood as fuel in homes and industrial plants, and advocates greater employment of petroleum products for these purposes.

"From 1901, when the first petroleum well with a commercial production was brought in in Mexico, until December 31, last year, our country has had a total production of 254,268,813 cubic meters of petroleum with a commercial value of 2,902,372,152 pesos (approximately $1,451,186,076, U. S.)," the statesman continues. "Of this fabulous wealth, only a small part has remained in our territory, approximately 15 per cent. All the rest has gone forth to the world.

"As a result of overproduction the exploitation of the world's largest petroleum fields, including our own, has decreased. In view of this fact, circumstances are most propitious to pay preferred attention to the satisfaction of our own needs. The occasion has arrived, in my opinion, to facilitate home consumption and thus promote prosperity, including that of the petroleum industry itself, activities of which have been restricted owing to the congestion in the world's most important markets. That must be our tendency, and it should also be the tendency of the petroleum companies.

"Development of the Mexican petroleum industry has suffered from the influence of the world wide economic crisis that has affected our country; a crisis, which, in the matter of petroleum, has reached such proportions that the leading oil countries have been compelled to adopt radical measures, with a view to balancing production with demand. Such measures have consisted essentially of the restriction of production and even drilling. Restrictive measures have reached their maximum development in the United States, resulting in a drop in production of 16,790,082 cubic meters during 1930. Similar measures, although on a smaller scale, have been adopted in Venezuela.

"It should not seem strange, therefore, that the depressed situation of the Mexican petroleum industry has not changed from the previous year; perhaps even somewhat more accentuated in restriction of exploitation. In 1929 Mexican petroleum production totalled 7,104,591 cubic meters, with a commercial value of 92,025,441 pesos. In 1930 it dropped to 6,284,563 cubic meters, with a commercial value of 80,932,254 pesos. Despite such conditions, Mexico now occupies the fifth or sixth place in world petroleum production and its position is extremely important. Both its yield and its possibilities are of great significance. Mexican production is superior to that of Colombia, Peru, Trinidad, the Argentine, India, Poland, and fifteen other countries. Because of its potentialities, it ranks among the leading petroleum countries of the world.

"This explains the interest that many

companies show in obtaining petroleum concessions in Mexico, and the reason why the concessions previously granted cover 12,491,661 hectareas. Total concessions solicited, both ordinary and preferred, cover more than 72,000,000 hectareas. In many cases drilling is under way, especially in the frontier States of the Republic, and in the fields of the Isthmus of Tehuantepec.

"The activities in the first of these regions has reached such a degree that the creation of a new agency for petroleum matters has been necessary. In some of the regions that are being actually exploited, indications have been obtained of the presence of oil beds whose localization is being attempted with great enthusiasm. Regarding the Isthmus of Tehuantepec, one of the beds has been discovered, 25 kilometers south of the famous field of Tonala.

Prominent oil men view the decision of the leaders of the majority party in the United States House of Representatives to sidetrack legislation restricting petroleum importations as giving the Mexican oil industry at least a reprieve, which will endure until next autumn. By that time, changed economic conditions may postpone indefinitely what is regarded in Mexico as an "imminent catastrophe." The BOLETIN FINANCIERO of Mexico City declares that effective nullification of the Mexican government's recently announced plans for the increase of production in the Republic would have been the first result of the enactment of the Capper measure and further consequences would have been very serious for the industry. The editorial intimates that there are still some measures that the Mexican government can take for the betterment of the petroleum situation. Among these, the newspaper says, are the lightening of taxes and the stimulation of consumption within the country.

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Mexican Gasoline Imports Attacked

MEXICO CITY, by Wireless.

RECENT imports of gasoline, from Aruba and Curaçao, refined from Venezuelan crude, is the subject of strong criticism in the leading daily newspapers of Mexico City. It is asserted that these imports, which have aggregated 3,399,512 bbls. during the last 60 days, are a maneuver on the part of oil companies to create public sentiment favoring a prohibitive tariff on petroleum products now being urged on the Mexican Government. Protected by a high tariff barrier the petroleum companies of Mexico, EL UNIVERSAL and EXCELSIOR charge, would control the market and increase prices far beyond the point that would yield a reasonable profit.

These charges were promptly refuted by J. A. Asheton, president of the Mexican Eagle Oil Company Ltd., in a statement published conspicuously in the same two newspapers. Drawing attention to the simultaneous publication of almost identically worded charges in both journals Mr. Asheton deduced from this that the information had been advanced by someone who is either misinformed or acting in bad faith.

The newspapers further declare that the threat made by the oil companies to shut down their refineries is an attempt to force the Government to enact the desired tariff legislation. Furthermore it is alleged that the petroleum companies are not operating at a loss, and this contention is supported by pointing out recent great expenditures undertaken by the petroleum companies in constructing pipe lines and improving machinery plants; expenses that would hardly be incurred at a time when foreign competition was seriously endangering the profits of the Mexican petroleum industry.

According to EL UNIVERSAL and EXCELSIOR, dismissal of workmen and the threat of completely closing down refineries in Mexico are efforts directed toward higher tariff legislation. Reduction in personnel made by leading petroleum companies is the result of slower operations necessitated by the work of installing new machinery, rather than the first step of a series that will end with the complete shutdown of refineries. That the oil companies would not voluntarily take this step may be deduced from the fact that they would be in danger of losing valuable Mexican concessions; that demobilization of an industry capitalized at over 25,000,000 pesos would entail heavy losses; and, because the refining industry in Mexico is reasonably profitable, judging from the improvements to property undertaken by the very companies that are threatening to suspend operations.

Mr. Asheton, in referring to the statement that petroleum companies have been laying off men as the result of slower operations due to the installation of new machinery, said that the production in the Tampico refinery of the Mexican Eagle Oil Company had dropped from 38,600 bbl. per day in 1930 to 24,500 bbl. per day this year. This fact, and not the installation of new machinery, according to Mr. Asheton, was responsible for the dismissal of more than 1,200 workmen in the past six months. Mr. Asheton further stated that it was impossible that Mexican oil companies had been displaying favorable balance sheets abroad. The Mexican Eagle Oil Company had paid only one six per cent dividend on common stock in the past six years. Reports of financial activities of all Mexican petroleum companies were held by the Government. If refineries were as profitable enterprises as stated in the published charges, it would be difficult to account for the fact that three important companies had recently closed their refineries and exported their machinery.

The explanation of the fact that companies owning valuable Mexican concessions were importing gasoline from Venezuela obviously was that it was more profitable than working their own concessions. Taxes on the Eagle company's gross earnings amounted to over 66 per cent, but taxes levied on importers were practically negligible.

DOUGLAS GRAHAME.

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PETROLEUM products to the extent of 60,000 cases were recently imported into Santos, Brazil, to a trading company controlled in Uruguay, and operating on the East coast of South America.

Experts Discuss Petroleum Economics

Review of Important Economic Papers Read at the Annual Meeting of the American Institute of Mining and Metallurgical Engineers. Influence of Crude Oil Potential on Stabilization.

THE Petroleum Division of the American Institute of Mining and Metallurgical Engineers, whose discussion of Production Engineering was reviewed in the March issue of WORLD PETROLEUM, devoted the last day of their annual meeting to a discussion of petroleum economics.

LEONARD LOGAN presented a paper entitled, Stabilization of the Petroleum Industry. The author emphasizes the point that the institution of property rights and the migratory nature of oil are responsible for the oil man's troubles by causing adjacent property development, which results in general overproduction. The most pressing problems in the petroleum industry today are curtailment of crude oil production and restriction of the manufacture of gasoline. Three major plans, to curtail the crude oil supply, have been proposed; unit operation, proration, and a tariff on imports. The author considers the unit operation plan the soundest both from an engineering and economic standpoint. On the other hand, the proration and the tariff, or embargo, are not considered permanent remedies, but rather measures of expediency. Mr. Logan proposes to establish a triumvirate dictatorship within the industry, to consist of representatives appointed by the President of the United States, the American Petroleum Institute, and the Independent Petroleum Association. This board would have authority to dictate when, where, and how much oil should be produced. The policy of *laissez faire*, favored by the independents, is blamed by the author for most of today's difficulties in the producing branch of the industry.

JOSEPH E. POGUE discussed the Economics of the Crude Oil Potential. The author arrives at several vital conclusions in this paper, and they are presented here fully, together with a graphic illustration confirming them. The following conclusions are made:

(1) The shut-in crude oil potential is the summation of the surplus initial production brought in during the past three years.

(2) The potential has the economic effect of an inventory, the effect being approximately one-half that of the potential converted into actual production.

(3) The price of crude oil correlates with above ground inventories corrected by adding thereto the inventory equivalent of the potential.

(4) If all drilling ceased, the potential would be sufficient to maintain crude oil production in balance with demand for twenty-eight months.

(5) If all restrictions were removed and the oil could be physically handled, the crude petroleum output of the United States in 1931 would be 1,500,000,000 bbl. In such event, the price of Mid-Continent crude oil would have an indicated decline to ten cents per barrel.

(6) The crude oil potential is still increasing, thus exerting pressure on crude oil markets.

(7) Some method of reducing the crude oil potential must be found in order to maintain the price level.

(8) The methods of control thus far practiced in the petroleum industry are faulty to the extent that they may have permitted the potential to increase.

(9) Any plan for stabilizing the petroleum industry that does not involve a reduction in the economic effect of the combined inventory is not fundamental and cannot be counted on to succeed.

H. J. STRUTH discussed the relation of gasoline to petroleum economics. The author stressed the fact that during 1930 the excess accumulation of gasoline undermined, not only the refined oil market, but the crude market as well. It is stated that the oil industry can effect a certain degree of stabilization by a program of production control built upon a foundation of gasoline supply and demand. Two outside factors are considered; the imports of crude oil and its products, which obviously must be controlled to make the domestic reduction of production at all effective, and the construction of refineries abroad, which indicates the eventual dissipation of America's forign oil markets, though this second factor will not be felt for another two years. The author states that at the close of 1930 the average gasoline yield per barrel of crude refined was 42.5 per cent and anticipates that this figure will be increased to 47.23 per cent by December, 1931. Mr. Struth shows that during 1930 the uneconomic refining operations resulted in an indicated loss of $35,000,000 whereas under a strict economic program a profit of $360,000,000 could have been made, indicating an economic loss to the industry of $395,000,000. The 1931 gasoline demand is estimated at 478,345,000 bbl., a gain of 3.94 per cent over 1930. The domestic consumption is not expected to exceed 408,056,000 bbl. (3.18 per cent increase), while exports are estimated at 70,289,000 bbl. (7.65 per cent increase). To furnish this quantity of gasoline in the United States during 1931 the refinery runs should not exceed 914,000,000 bbl., of which total only 854,000,000 bbl. should be taken from domestic oil fields, since about 60,000,000 bbl. of foreign crude undoubtedly will be run to stills.

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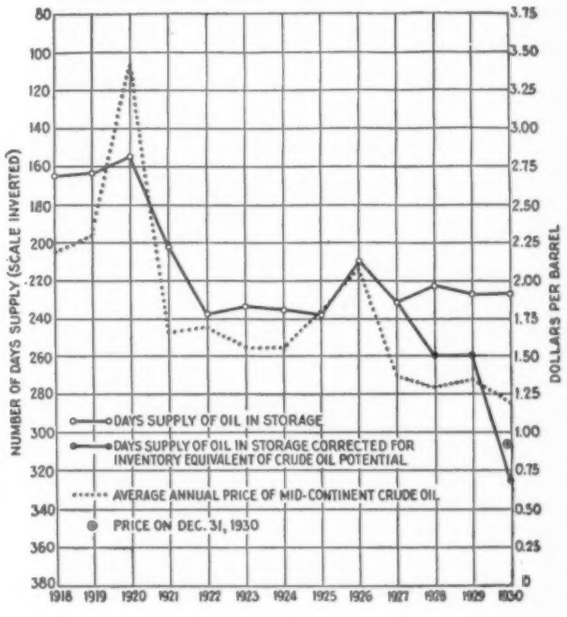
Illustrating Mr. Pogue's Paper



Purchasing Oil Equipment For Overseas

Reflections Resulting From Many Years' Experience with Buying Machinery, Tools and General Supplies for Overseas Oilfields and Refineries.

By C. G. Padel

IN clear terms the author, who is connected with one of the great international oil companies, outlines the procedure followed today by major concerns when purchasing equipment for their overseas oil field and refinery operations. Conditions naturally differ considerably from those existing in many American oil fields where there also are numerous and comparatively small drilling and refining concerns. In covering purchasing Mr. Padel's article also forms a valuable guide to selling to the oil industry. Where the manufacturer's method of sales approach is in harmony with the buyer's policy results are more likely to be satisfactory.

HOW things have changed! Not so many years ago the equipment and supplies bought and used for the oil industry was more of a hit or miss proposition than anything else. For actual drilling needs devices designed by the man on the spot for his immediate particular problem were made by a forge shop or possibly by a blacksmith, and that was all there was to it. Now-a-days hundreds of these devices have been refined down to highly scientific engineering appliances, accurately and carefully made, each fulfilling its special function in the most economical manner possible. The constant appearance of new and ingenious improvements is but one example of the way modern methods have been introduced into this industry, and are spreading to every oil producing country of the world.

Quality Versus Cheapness

Money is by no means as easily made in the oil business as it was in those days. Speed at any cost then meant money, and economy and efficiency were distinctly secondary if not entirely unknown. Today, even when speed is important, money can seldom be made except by co-ordinating factors inherently economic and efficient. Makeshift material as well as makeshift methods will no longer fill the bill. The material must be the best of its kind, and as suitable and good in quality as can be obtained, for in oil, perhaps more than in any other undertaking, poor and cheap material is liable to prove more costly than in most, because of the severe service to which it will in all probability be subjected.

Just as great is the change that has taken place in the methods employed in the procurement of material for oil fields and refineries. How to get value for money, interpreted in a modern enlightened manner, is something quite different from what it used to be. Getting value for money is still the slogan; but formerly this savoured more of getting one's pound of flesh than anything else, whereas that is not nearly as much the main consideration now. Getting value for money now means "getting together." That is to say, combining the purchasing function with the scientific and engineering, coupled with the experience gained in practise by the users in the fields and refineries, augmented from without by the service freely offered by manufacturers, so that the latest and best available may be obtained. Economic necessity and scientific progress have brought this about. Co-operation is the keynote of this policy, bringing into play the concerted knowledge of the buyer's organization as well as the seller's, generating a spirit of good-will which is the surest guarantee of accomplishment.

Face Value or Real Value

Buying is a peculiar business, and not quite as simple as it seems. Before examining the way the large international oil companies operating in foreign fields handle this part of their business, a word about certain elementary and

To stand a strain like this, a storage tank must be well built, and not bought solely on a price basis

Orders for miles of drill pipe and casings call for careful executive scrutiny

fundamental economic facts, which make all the difference between good and bad buying of anything for any purpose, is necessary. Necessary because, in spite of progress in other directions they are too often disregarded; and because true efficiency in all departments, on which industrial profits more than ever depend, hinges on them. Never has industry faced a more urgent need than that which now exists to take them seriously. They chiefly concern the question whether one is content to rely on fictions more than on facts by buying on face value instead of on real value. One can usually buy cheaper on face value, and the initial expenditure being less, and the transaction showing a saving, appeals to the majority most. Paying more for real value, and eventually saving a great deal more, though less showily, is not nearly as impressive and so is heeded the least. Consequently profits are impaired and much unnecessary waste takes place which might easily be avoided.

All buying negotiations imply bargaining. Bargaining, however, for what are popularly termed bargains, is not the true object of good buying. Were that its principal aim industry would soon be bankrupt. It could never continue to exist, much less thrive, on bargains. A bargain is something that has been secured at a price below its real value. Cheap goods compared with dear are considered by many as bargains. Economies based on parsimony exemplify the fallacy that the less one spends the more one must be making. They create an unwillingness to pay for a thing what it is worth if one can avoid doing so, and a desire to get as much and give as little in return as possible, all of which is short-sighted and the falsest economy. Cheapness is a luxury few can afford. Quality cannot be bought or sold cheap. Cheap things have a nasty habit of nullifying their vaunted advantages by deterioration, breakdowns, delays, and inefficiency, all of which are expensive. First cost savings are mostly false cost savings. If their subsequent on-costs were taken more notice of fewer would be misled by them. No industry has had more positive proof of the losses these things entail than has the oil business. A few instances of its effect will readily make this apparent.

High Cost of Cut-Price Products

For oil well drilling purposes the best is not too good, no matter what it costs. Dependability and serviceability matter most, and especially so in far flung fields, thousands of miles from the source of supply. Fishing for broken tools, collapsed casing or twisted-off drill pipe at the bottom of a well may take weeks, and besides delaying drilling may involve heavy material and monetary loss. If supposed economy in using anything but the best is the cause, any savings from that source will very quickly be dissipated.

Spending a few dollars less for an inferior valve or fitting may, if it fails, result in a whole pipeline system being held up. The consequent loss of revenue in stoppage of deliveries of oil, and the cost of delayed tank trucks, tank cars, or even tank ships would be quite out of proportion to any hypothetical saving supposed originally to have been effected.

Insistence on low prices causes some manufacturers to lower their standards to get business. Gasoline tanks made too light, with thinner and lighter plates, reduced by manufacturers to meet enforced price cuts, have been known to rupture from expansion brought about solely by hot weather, resulting in loss of life through the ignition of their highly volatile contents. Fire is one of the oil industry's greatest dreads. A trivial failure in a refinery may start a fire involving the loss of many lives and thousands of dollars. Some time ago it was learned that cast iron valves fracturing under heat spread fires which had they been made of cast steel would have been confined within easily controllable limits. Although the cost of the latter is double that of the former, by no stretch of the imagination can the saving made by buying the cast iron be compensated for by the risk run.

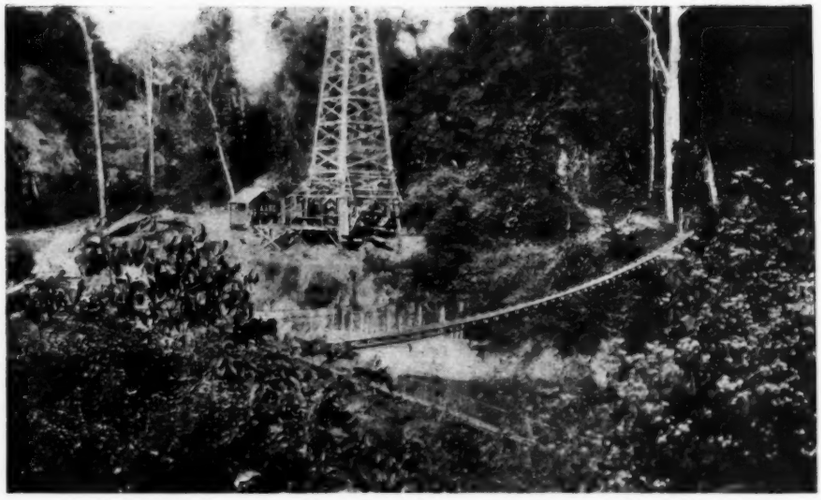
Huge Equipment Stocks

Reverting now to the procurement of new material for major oil companies whose operations are international. In addition to operating stores, and sometimes commissaries, at strategic points to supply drilling needs, pipeline upkeep, and possibly refinery and new construction requirements also, it should be realized that living accommodation has to be provided for field men, with a more substantial and permanent type for married and single staffs. This includes modern bungalow colonies, clubhouses, recreation grounds, cinema theatres, hospitals and so on, in tropical or sub-tropical climates where living conditions, food, health, and relaxation are vital. The purchase of the requisite ma-

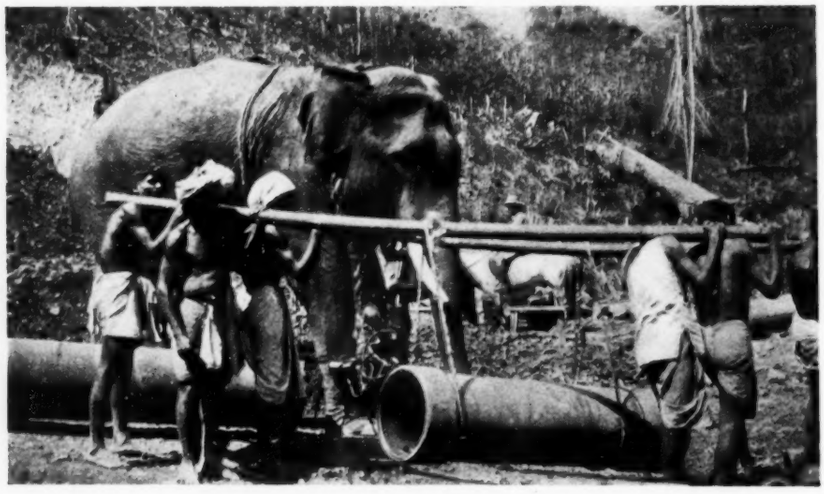
One reason why quality is the most important factor in overseas oil field purchases

terial can be seen to be no small problem. Many companies carry at least 15,000 different articles in stock, and all this, not infrequently, far from the seaboard, with only primitive facilities, and slow and by no means reliable transportation to depend on. For me to attempt to enumerate here what this involves would be impossible, but a short outline of the general way in which some of this large variety of equipment is procured may prove of interest.

The large units and main machinery required for processes are mapped out at the head office of a company in line with policies decided on, and, after due investigation and research, are bought as a rule under its direct supervision and authority. Beyond this, practically all purchases, except small local requirements, must first receive head office sanction. Once authorized the choice of a purchase, although always more or less subject to its approval, more directly falls on the individuals or groups most closely in touch with conditions which govern its use. Supplementary to this are comparative tests made under operating conditions, research by the engineering staffs, reports of inspectors, and information disseminated as gathered, for the benefit of all concerned.



To the drilling crew in the heart of the jungle, reliable equipment is of the greatest importance



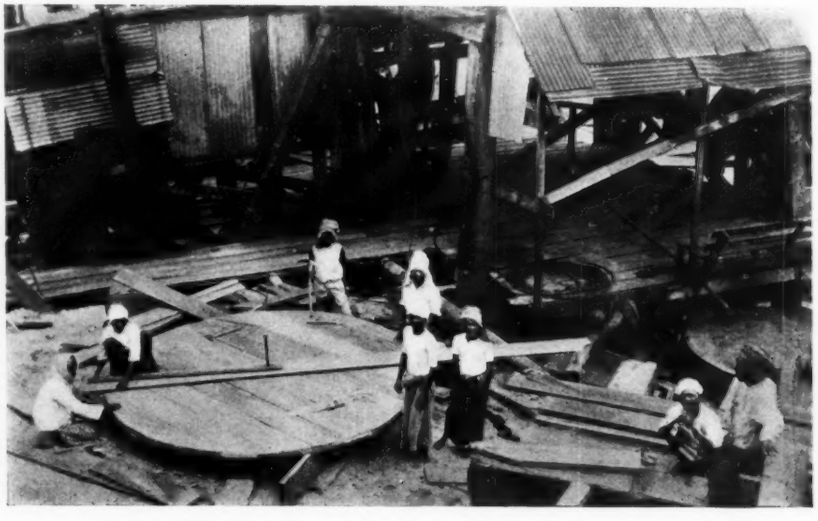
Drillers Not a Factor

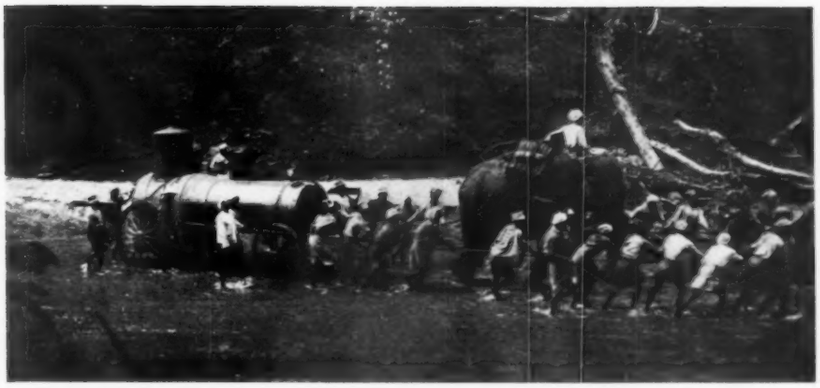
Drilling equipment bought is thus largely dependent on recommendations from the respective field managers and superintendents in agreement with their drilling superintendents, although as progress in standardization, with which all companies are occupied, is made, efforts are concentrated on using similar equipment in all fields as far as that is feasible. With this class of material, however, uniformity is not always entirely possible, partly because drilling in different strata necessitates the use of different equipment, and partly because the economic advantages of special devices and improved appliances that are constantly making their appearance make rigid standardization difficult.

In any case drillers and tool dressers are no longer allowed to exercise their predilections for certain makes of equipment, designating what they will or will not use, as they used to do. Operations have become too scientific to permit this any longer. These same remarks may be said to apply in general to the special equipment required for refinery and other uses, the choice of which is handled in much the same way by the manager, engineer, or superintendent in charge, as the case may be.

Material less special in its nature, used

The type of labor in some of the foreign fields is sometimes somewhat primitive.





En route to the jungle wildcat site

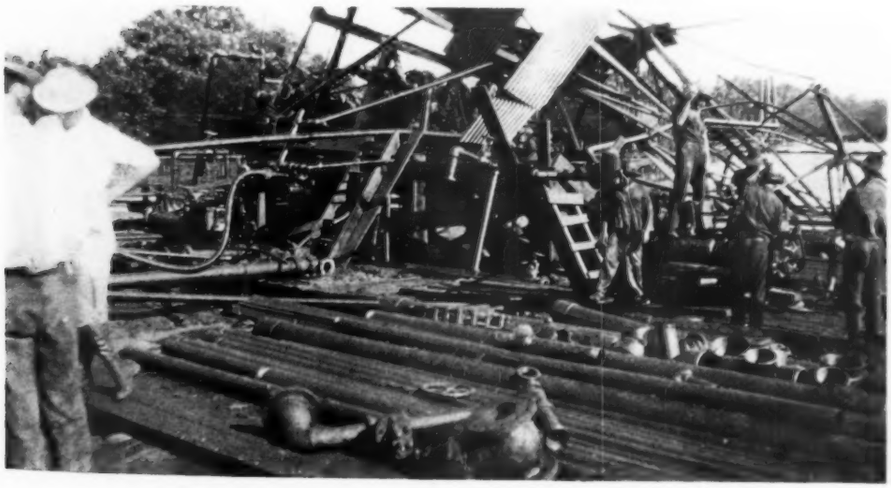
for more general all round purposes as carried in the stores, comes under rather a different category. There is more uniformity here, and many of these articles and appliances are made and sold at uniform prices by a variety of makers. Interchangeability where necessary is assured, quality however is not, and this may vary considerably. Hence the question of quality arises in making these purchases. In these matters the purchasing agent, guided by the recommendations of the company's engineers, reports and collected data, as previously outlined, is the deciding authority.

In handling requisitions as they come from the centre of operations or head office, two methods of proceedure are generally followed. Those which comprise special equipment are purchased rigidly according to make as specified, unless for some unusual reason reference back to headquarters is advisable. The others, in which the purchasing agent has latitude of choice, are bought as he decrees.

Since the standardization of much oil field equipment by the A. P. I., a good deal of material formerly exclusively obtainable in the U. S. A. can now also be bought in Europe. Consequently in such cases a considerable inter-change of information on prices and quality takes place between the various buying offices of oil companies, by both letter and cable before decisions are arrived at where these orders shall be placed.

A warehouse in an oilfield abroad may carry 15,000 different articles

A valve selected on price as the major factor can cause this



Trade Journal Advertising

The equipment manufacturer's part in all this now remains to be considered. No less radical has been the change that has come over them than that already noted in the equipment itself, and in the manner of its purchase, they having for the most part learned that nothing that is second rate will satisfy their patrons' requirements. High pressure salesmanship carries little weight. What is wanted is responsibility, reliability, and engineering experience and service. In this many manufacturers have earned and deserved recognition of the advantages afforded by co-operation. One has but to glance at the profuse and instructive advertising in the trade journals to realize how progressive manufacturers are. These journals penetrate to the ends of the earth and keep field men and buyers, who scan them, *au fait* with the very latest developments in equipment.

Contact between manufacturer's representatives and oil company's officials is fairly easily established when the latter's activities are confined to the United States, but, when they are remote, as in the case of the international oil companies, access to them is more difficult.

Sending Agents Abroad

Although, as described, much of the information manufacturers have to impart reaches officials abroad through the medium of their purchasing agents or engineers, some of them not unnaturally feel that by occasional opportunities to have personal contact with these officials they can render them assistance which cannot be as comprehensively covered by catalogues or correspondence. In addition to this, familiarity with special local conditions is acquired, which better fits them to adapt themselves to them.

With this in mind manufacturers send representatives from time to time to

(Continued on Page 290)

26 Broadway, New York, a great industrial army's G. H. Q., and one of the best known addresses in the world. From these offices overlooking the harbor is directed the production, refining, transportation and marketing of petroleum and its products in dozens of countries. The original building was erected in 1885, and the present structure was started in 1920 and extended in five additions as the business grew, the last being finished in 1926.

Colossus of America's Petroleum Industry

Permeating the Entire Standard Oil Organization the Rockefeller Spirit Has Been a Great Factor in Its Development to a Remarkable Industrial Company. By L. B. N. Gnaedinger

STANDARD OIL of New Jersey, portrayed in the accompanying article, is a lineal and logical successor of the original Standard Oil Company organized by John D. Rockefeller and his early associates. It still bears the Rockefeller imprint and in all its operations typifies the spirit of thoroughgoing efficiency which its founder impressed upon it. Though one of the largest corporations in the world there is an entire absence of ostentation in its attitude, while its operations are conducted with the smoothness that results from careful planning to a definite end. Here, again, is revealed the Rockefeller touch.

This is the second of a group of articles descriptive of the business structure, equipment and operating methods of great international petroleum companies.

LARGEST of all American oil companies and ranking among the five greatest corporations in any field is Standard Oil (New Jersey). Its properties, scattered throughout the world, comprise an industrial empire. Many of its divisions are of such size that if left to stand on their own feet they would compare impressively with the leading enterprises in their respective fields. Though primarily an industrial, Jersey Standard is not only a producer, refiner and distributor of oil and its products but is the operator of the largest specialized trade fleet afloat, a great by-product chemical company producing a large part of its own requirements and a public utility with an enormous network of gas, gasoline and oil pipelines.

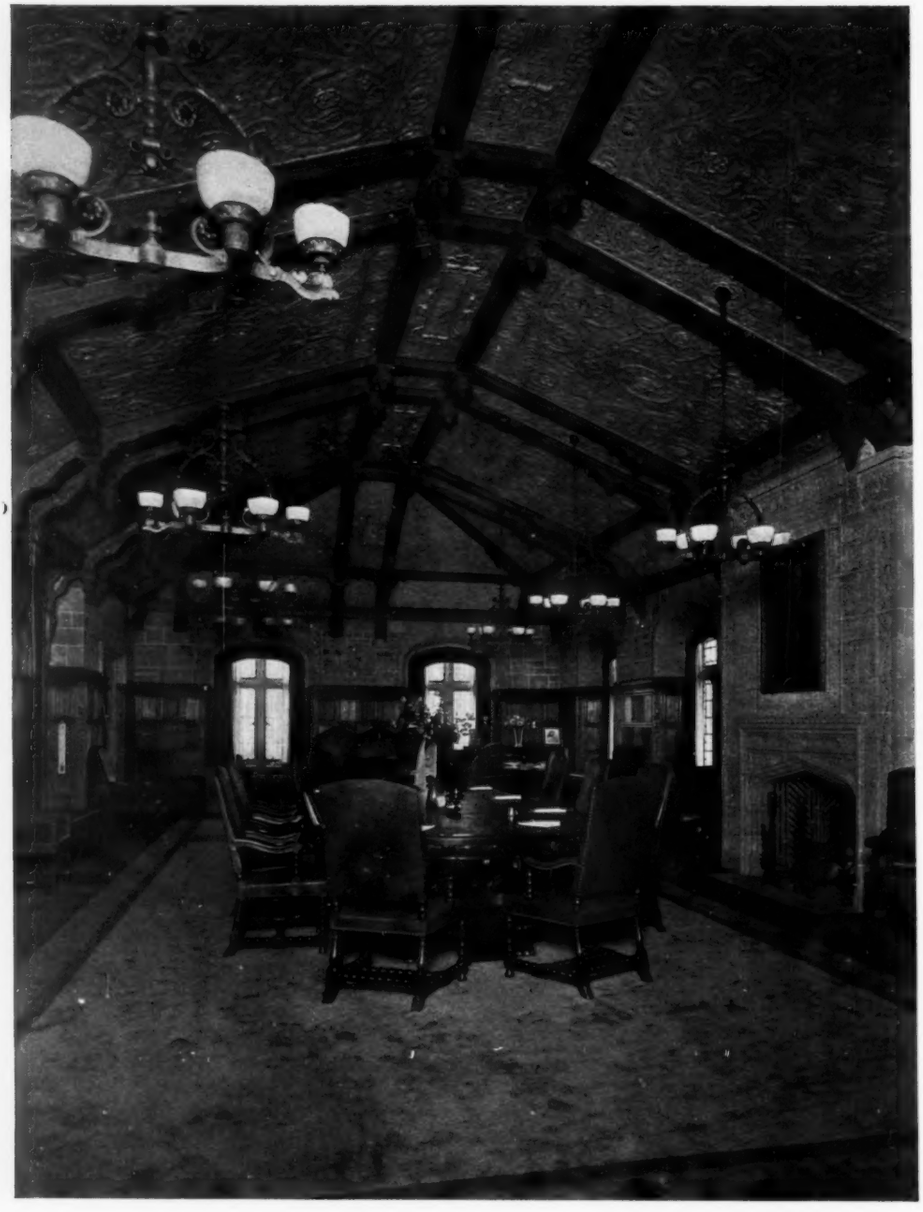
Standard Oil (New Jersey) is a vertical consolidation. It controls the source of about one-half of its raw material, all of its manufacturing and most of its distribution. Its products range from fuels to cosmetics. No process is too large and none too small for Jersey Standard. As the custodian of large amounts of cash in behalf of itself and its subsidiaries, the company is also a banking organization. The millions it has put into the call money market at different times have exceeded in volume the commitments of many sizable fiscal institutions.

Only one other company in the petroleum industry compares with Standard of New Jersey in the extent of its resources and operations. That is the Royal Dutch Company for the Working of Petroleum Wells in the Netherlands Indies and its allied Shell (British) group. In crude oil resources the Jersey company is second only to this Royal Dutch-Shell group, while its refining and distributing systems exceed those of any other company. The vast scale of its activities is indicated by the size of its gross earnings, which amounted to $1,523,000,000 in 1929. In that year the net profit available for dividend distribution among its 103,000 shareholders was $121,000,000.

Standard Oil of New Jersey is a lineal descendant of the company formed in 1870 by the then young John D. Rockefeller. This original company was launched in a field which was a most hazardous sphere of endeavor, in which management was reckless, methods wasteful, output unstable and financial results uncertain. It seems strange that the seething, unsettled, irresponsible "coal oil" industry as it existed sixty years ago, a business that attracted and was largely dominated by adventurers, should have appealed to the careful, painstaking, orderly mind of John D. Rockefeller. Yet it is probable that in no other field could he have found the same opportunity for the exercise of his remarkable ability for organization, expansion and the elimination of waste. The ideas and the methods applied to the oil business more than half a century ago by the elder Rockefeller and the group of associates that he drew around him resulted not only in the creation of the colossus known today as Jersey Standard, but also in the stabilization of the industry to a degree that would have seemed impossible at that early date.

The earlier development of the Standard Oil group of companies has formed the subject of many histories. It is not the writer's purpose to retrace that record here but it seems pertinent in passing to mention that Standard of New Jersey, more perhaps than any of the companies formerly related to it, still bears the imprint and responds to the influence of its founder. In whatever part of the world one comes in contact with the mechanism of its vast organization there is an impression of innate power in an atmosphere of quiet efficiency that seems to be characteristic of this particular corporation. As it stands today the company is a concrete manifestation of the genius of John D. Rockefeller the elder. It is stimulated not only by the impetus imparted by his early work but also, as may not generally be known, by the interest he still maintains in its operations.

The ninety-two year old capitalist, who retired as head of the company in 1911, still keeps in touch with the organization. He may be wintering in Florida, but this does not prevent him from using the telephone that he may be conversant with developments affecting his creation. A story which has received credence in Wall Street is illustrative of this feeling Mr. Rockefeller has for his company. It is related that he got wind of the aims of a pool which



purposed to run up the price of Jersey Standard stock in a fashion which Mr. Rockefeller considered destructive. As soon as a rumor of the project came to his ears, it is said, Mr. Rockefeller made some well-placed inquiries. Becoming satisfied that the report was correct, the story goes that he caused the pool managers to be reminded that he controlled sufficient Jersey Standard stock to pour into the market a deluge that would soon drown the operators in the wreckage of their scheme.

Whether or not this incident occurred exactly as related it is evident that the principles on which Jersey Standard operates remain those which were enunciated by Mr. Rockefeller and his associates when they formed the old Standard Oil Company of Ohio. These principles are efficient utilization of the last fraction of raw material, aggressive marketing and constant alertness to any new developments which may improve the industry. Conforming to these principles is the policy of conservation and elimination of waste wherever possible If there be waste in the oil industry as a whole, and great waste does exist, it is because the policies set down years ago by Mr. Rockefeller are not everywhere followed.

In those days the production of petroleum was concentrated in Ohio and Pennsylvania. Wildcatting was, of course, the standard method of the day in the development of the new-found resource. The market was either glutted or starved. Refineries and the fortunes of their backers frequently disappeared in flames, perhaps providing temporary prosperity for rivals who, only a short time later, suffered the same fate. The product sought from petroleum in those days was kerosene. All else was waste and the manufacturers, in their haste, frequently left so large a portion of the then useless gasoline in their output that their refined product had a deservedly dangerous reputation. Little or no effort was made to exploit petroleum for its value as a fuel or for other purposes.

The beginning of a technique in oil production may be dated from the entrance into the industry of John D. Rockefeller and his associates: Henry M. Flagler, Charles Pratt, O. H. Payne, William Rockefeller, J. A. Bostwick, W. G. Warden, John D. Archbold and Benjamin Brewster. While neither they nor others could forsee all the multiform products and purposes for which petroleum would be utilized in future years, the search for new uses, the systematic development of hitherto untried markets and the employment of cheaper and more efficient methods of distribution, features of the industry for which they were largely responsible, have contributed in an immeasurable degree to its vast expansion and improvement.

Both in the domestic and international fields, Standard Oil of New Jersey has

The Jersey Standard board of directors room at 26 Broadway forms a striking contrast to the old Cleveland office of John D. Rockefeller Sr.

been a leader and a stabilizing factor. In conformity with the cosmopolitanism which its extent has thrust upon it, the company, in its international activities, not only has maintained friendly relations with German, French, Dutch, British, Columbian, Venezuelan and other nations, but has acted to restore harmony in controversies in which it was not a partner. This it did when the Royal Dutch-Shell interests fell out with the Standard Oil of New York and the Vacuum Oil Company with respect to the purchase of Russian oil by the two latter companies. The Royal Dutch interests, which had lost properties formerly owned in Russia through the change in governments in that country, bitterly opposed the action of the two American companies and in retaliation began cutting prices. In India, where Royal Dutch-Shell and Standard of New York compete, the war reached serious proportions. It was particularly inopportune, as at that time general conditions in the industry were not good.

Although Jersey Standard formerly had operated properties in Russia, it had kept free from controversy with the government of that country. It did intervene in the contest between the British and American interests. Following conferences between Walter C. Teagle, the young and vigorous chief-executive of the corporation, and Sir Henry Deterding, head of the Royal Dutch-Shell interests, the differences were composed.

Competition between Standard of New Jersey and the Royal Dutch-Shell has been carried on vigorously in Europe and elsewhere, but relations between the two companies always have been amicable, and this condition was not affected by the invasion of the American market by the Royal Dutch-Shell, newspaper reports to the contrary notwithstanding. Jersey Standard strives to maintain like relations with the governments with whom it may have negotiations. The policy of the company is to remain neutral in all political affairs.

Walter Clark Teagle, executive head of the Standard Oil Company of New Jersey
Kaiden Studios

A Pennsylvania oil field in the early Rockefeller days

When the Rockefeller influence is mentioned it must be recalled that this is now exercised in great part through the elder Rockefeller's son, John D. Rockefeller Jr., who has undertaken to concern himself particularly with moral and social issues as they affect the industry. The good relations that Jersey Standard maintains with the army of 112,000 men and women who carry on its work the world over, from the plains of Canada to the tropic jungles of South America, reflect the influence of John D. Rockefeller Jr. The sale of stock to employees is one of the methods which he has approved. There are 26,300 employees who hold stock in the company and they received 100,000 of the 400,000 quarterly dividend checks mailed last year. The interest of the company in its employees takes such forms as the provision of efficient hospitals to care for workers scattered in the more out of the way parts of the world.

A Jersey Standard well in Poland

Since neither the Rockefellers, father or son, are officers or directors of Jersey Standard, it is obvious that somewhere in the organization there exists a source of power which keeps the organization impermeated with the principles estab-

From the Company's loading piers at Bayonne, N. J., tankships leave for all ports of the world

lished by the Rockefellers. This source of power is, of course, Walter C. Teagle, president of the company, in whom these ideals reside by natural descent and early training. Mr. Teagle's maternal grandfather was M. B. Clark, the first partner of the elder John D. Rockefeller, and he inherited an interest in the oil industry through his father, John Teagle, head of Scofield, Sherman and Teagle, a firm active in the industry at one time.

It may be accepted that Mr. Teagle was expressing views shared by John D. Rockefeller Jr. when he recently described the relation of his company to the public at large. Said Mr. Teagle:

"In the United States we are moving rapidly, surely and yet almost unconsciously toward a condition of public ownership, with none of the disadvantages of government ownership. The executives of industry are becoming the salaried custodians of the invested savings of the American people. It is well to bear this in mind, for it means that anything affecting large corporations also affects that large part of our population which owns them. Today, the American people are regulating big business. They are its proprietors and the consumers of its products."

Of the company's relations with its employees, Mr. Teagle had this to say:

"Modern industry encourages employees to acquire ownership, and ownership is an incentive to loyalty and efficiency. A loyal efficient staff is a greater asset than many of the items listed on a corporation's balance sheet."

Unusually big physically as well as mentally, Mr. Teagle has shouldered great responsibilities in meeting situations arising from the war and its aftermath. In these situations his efforts have been directed in a way calculated to prove beneficial for the entire industry rather than for the selfish advantage of his own company. This applies to conservation and similar objectives.

Mr. Teagle joined the export committee of the Standard Oil Company (New Jersey) in 1903 and became a director in 1910. In 1911, he became the president of the then small organization known as the Imperial Oil Company of

The Jersey Standard's Bayonne refinery is one of the great sights of New York harbor

Most of the Company's research work is carried out at the great Bayway plant. Here the first commercial hydrogenation unit was constructed

Canada, and this connection was a factor in a development which was important not only in the history of the oil industry but in the history of the world. Mr. Teagle happened to be in Europe when the war broke out in 1914 and, grasping the situation, he hurried home and rapidly put Imperial Oil in a position where it could meet the sudden and great demands put upon it through the outbreak of hostilities. In a short time it was transformed from a relatively unimportant refinery and marketing company into a huge integrated corporation ranking second in the industries of the Dominion.

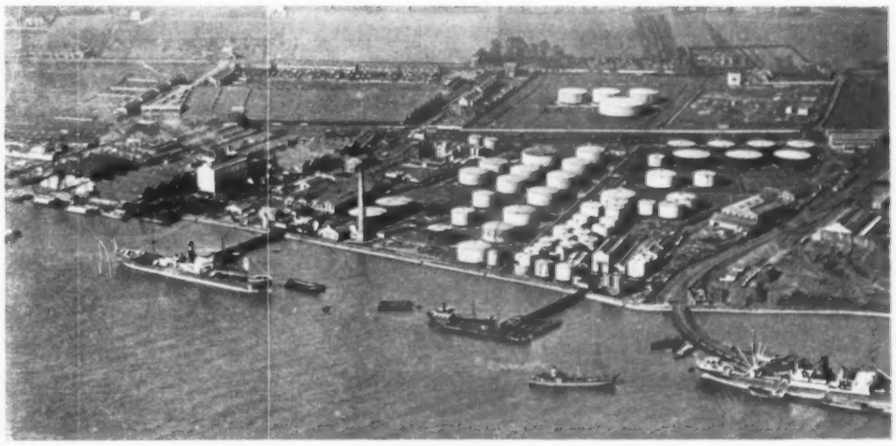
When the United States entered the war, the American oil industry was faced with the same problem the Canadian company had met. Jersey Standard promptly realigned its forces to cope with the new responsibility. A. C. Bedford, who then was president, was freed from actual operating duties and made chairman of the board. When it was sought to find a younger man to speed production and shipment overseas, the Jersey Standard directors turned to their Canadian subsidiary and called Mr. Teagle to the presidency of their company.

The part played by Jersey Standard in the war is now history. Through its efforts and those of other companies "the allies floated to victory on a sea of oil."

Though powerful in resources and influence, it cannot be said that Jersey Standard dominates the oil industry of the United States. In 1906, the Standard Oil Company (New Jersey) was, like the present company, the largest in the world and it controlled about 85 per cent of the oil business. Jersey Standard is still the largest oil company, with business far in excess of that of its predecessors, and its production last year was the largest of any company in the United States. Nevertheless its share of the petroleum business of the country is only about 14 per cent of the total.

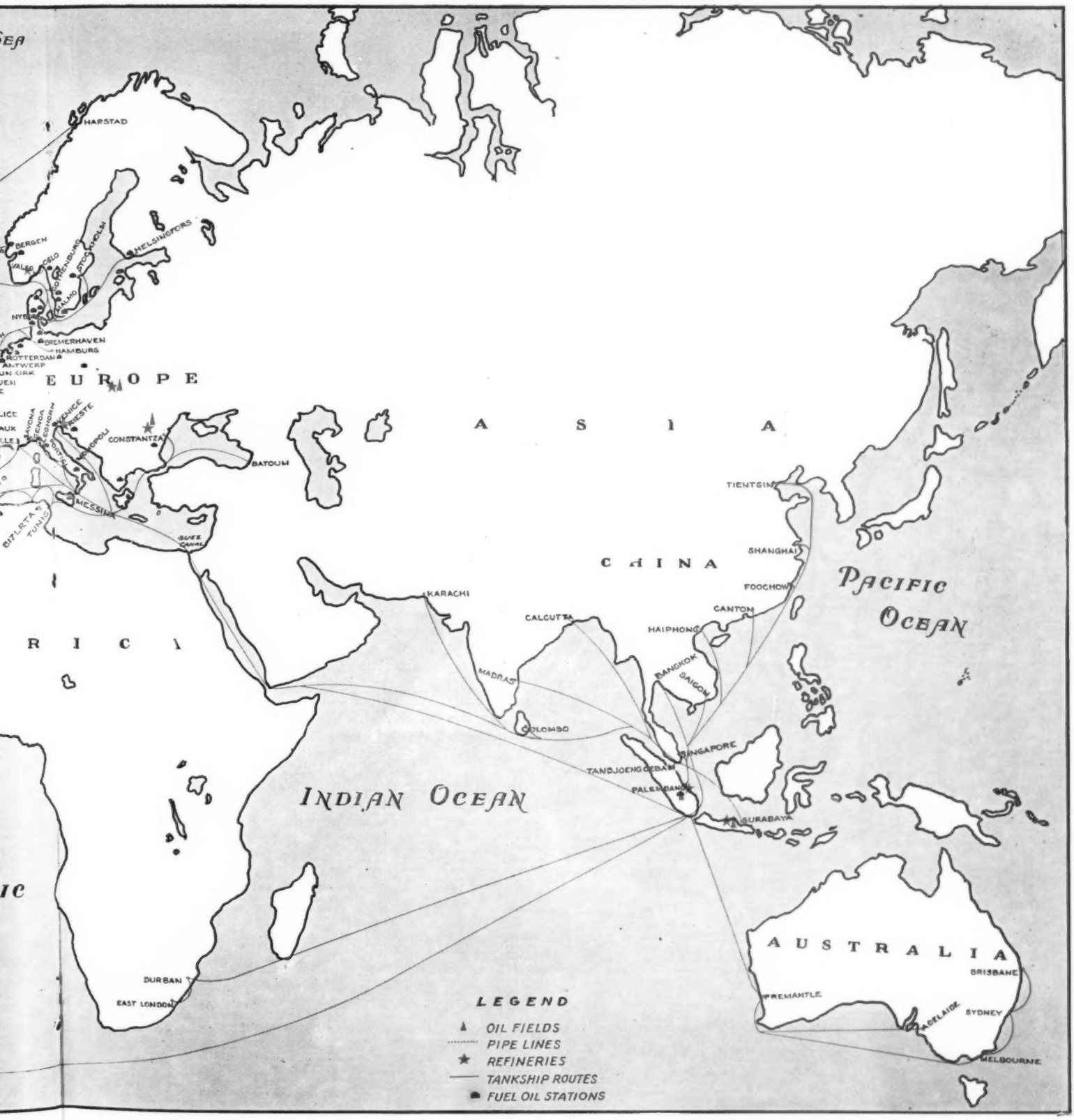
A survey of Jersey Standard's holdings and properties shows how the principles set up by the elder Rockefeller in 1870 are still in active employment. The old Standard Oil Company made it a policy to spread its collecting agencies into every oil producing area as fast as it was opened and today the producing properties of Jersey Standard run the length of the Americas and are scattered in such widely-separated countries as Poland, Roumania and the Dutch East Indies. Jersey Standard is also represented in the, as yet, undeveloped great Iraq field in the Mid-East which is destined to become of considerable importance in the markets of the old world.

At home, the company's subsidiaries



Standard marine depots dot the harbors of the world. Purfleet, Anglo-American Oil Company

JERSEY STANDARD'S World-wide operations . . . . . ▼



▼ . . . . . **TANKSHIP ROUTES cover the Seven Seas.**

Jersey Standard geologists search for oil in the wildest and most desolate parts of the earth. A well in Bolivia

in Ohio, Pennsylvania and West Virginia control 2,838 acres of oil lands and in Louisiana, Oklahoma and Texas there are 10,000,000 more acres under its control. Jersey Standard was in 1930 the largest producer of crude in the United States, its output almost reaching the total of 51,657,000 barrels it produced in this field in 1929.

Outside the United States and within the Western Hemisphere Jersey Standard's principal producing properties are located in Mexico, Bolivia, Venezuela, Trinidad, Colombia, Peru and Argentina and in Canada. The South American properties cover some 12,000,000 acres and are said to have a productive capacity of more than 36,000,000 barrels annually. The output from Colombia and Peru amounted to about 20,000,000 barrels in 1930. The Far Eastern properties produce 4,000,000 barrels annually. The Mexican properties, though below prewar levels in output, produced 3,000,000 barrels in 1929 and 2,000,000 barrels in 1930. These properties with those in Venezuela, Roumania and Canada, produced 49,442,000 barrels in 1929 and somewhat less in 1930.

The refining and marketing organizations of the company are commensurate with its productive capacity. Its refineries are distributed through the Americas and Europe, and it holds important positions in the oil trade of Great Britain, France, Germany, Poland, Switzerland, Holland, Belgium, Denmark, Norway, Sweden, Finland and Central and South America. Jersey Standard's refineries in the United States have a capacity of 530,000 barrels daily and its plants in Canada, Peru, Argentina, Colombia, Cuba, Mexico, Roumania, Italy and the Dutch East Indies have a daily capacity of 170,000 barrels more.

The company has a vast organization to distribute its products at retail in the American markets. Through the Standard Oil Company of New Jersey, a Delaware corporation, it operates 1,000 marketing stations in New Jersey, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina and the District of Columbia. Through Standard of Pennsylvania it operates in the Keystone state. Through Standard of Louisiana it operates 435 stations in Louisiana, Arkansas and Tennessee and through the Colonial Beacon organization it markets on a small scale in New York and New England.

In Canada, its subsidiary, Imperial Oil, Ltd., operates 885 marketing stations. In Cuba and the West Indies, the West India Oil Company distributes in bulk and at retail.

To convey its petroleum and petroleum products, Jersey Standard has a worldwide transportation system. Its pipe lines in the United States, including gathering lines, total about 13,000 miles, and its tanker fleet is the largest of its kind. This fleet, operated through various subsidiaries, greatly exceeds in size the fleets owned by such organizations as the United States Steel Corporation or the United Fruit Company. Moreover, unlike the vessels of these organizations, the Jersey Standard tankers carry no general freights but only the parent company's products. Jersey Standard's fleet could not undertake a general business because their sailings are determined solely by the needs of the company. A tanker may be well started to one port only to be diverted by radio instruction to another destination. The fleet totals 130 motor and steamships with a dead-weight tonnage aggregating 1,380,000, and these will soon be augmented by ten more bulk oil carriers.

Like other oil companies, Jersey Standard is taking on the functions of a public utility through its production and distribution of natural gas, an ideal fuel, which, as it occurred in the earlier years of oil production, was largely wasted. The company was quick to see the possibilities of gas and it now sells the fuel in Ohio, West Virginia, Pennsylvania, Illinois, Colorado, Missouri,

Rain never falls on this part of the Chilian coast, near Antofagasta, where a Standard subsidiary has a depot

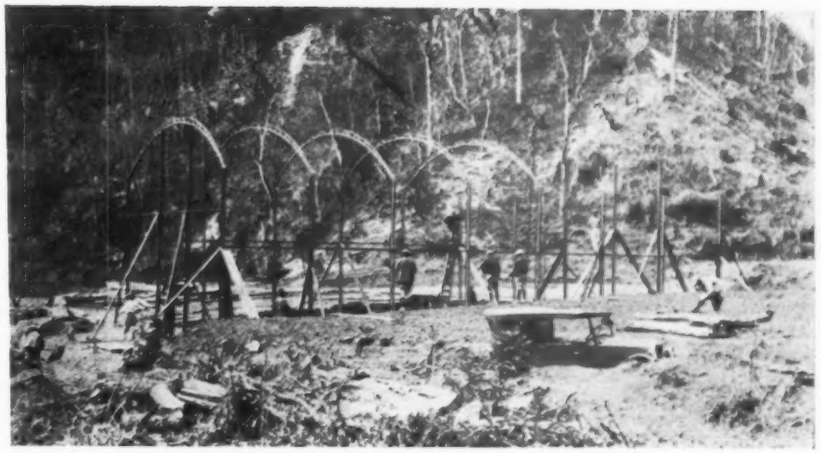
Louisiana and other states. In association with other companies it operates a gas pipe line from the Texas fields to Denver, Colorado. Eventually, natural gas will be piped to Chicago and distributed by the Insull companies.

In its role of public utility, the company markets natural gas in the amount of 100,000,000,000 cubic feet annually, some of it purchased. This it delivers through 15,500 miles of owned pipe lines.

A recent addition to this Company's varied interests is that represented by the Atlas Tire Company, formed to market automobile tires through filling stations.

With the growth of aviation a new field for the use of the company's products has been developed. The importance of efficient and uniform fuel and lubrication in flying is such that a special organization for dealing with the problems presented by aerial navigation was set up. This is the Stanavo Specification Board, Inc., jointly owned by the Jersey, Indiana and California Standard companies. The company has conducted extensive tests in its particular field and operates a fleet of fifteen airplanes which are used for demonstration work, for aerial photography, and for the convenience of officials in making business trips. The company employs twenty air pilots and maintains a hangar at the Newark (N. J.) Airport. One of the Stanavo planes, illustrated on another page has travelled more than 125,000 miles covering all parts of North and South America. It holds the time record for flight between New York and Buenos Aires. The company uses planes in its overseas production operations, such as in Venezuela and Colombia.

Rounding out Jersey Standard's operations are the Interstate Cooperage Company, which manufactures barrels and boxes from timber cut on its own lands, a large plant at Bayonne, New Jersey, that makes cases and tin cans, and the Gilbert & Barker Manufacturing Company, which builds pumps and tanks for petroleum products, oil burning apparatus and gas-fired furnaces for industrial purposes.



Standard engineers build bridges and roads through the dense tropical jungles

The history of the company may be divided into four stages: inception and growth to 1911, the year of the Sherman anti-trust act dissolution decree; adjustment to that decree; expansion in the war, and the extraordinary development since the war.

The original Standard Oil Company of Ohio was formed by John D. Rockefeller and his associates in 1870. In 1882 stocks of the latter company and its subsidiaries were transferred to the Standard Oil Trust and, in the same year, the Standard Oil Company (New Jersey) was formed and exchanged its entire capital stock with the trust in return for some cash and the New Jersey properties of Standard of Ohio. In 1892 the Standard Oil Trust was dissolved and then the capital stock of Jersey Standard was distributed among holders of Standard Oil Trust certificates.

By 1906 Jersey Standard operated through thirty-three domestic corporations. Today, the Jersey corporation is purely a holding company, controlling about fifty companies.

In 1911, in compliance with the decree issued by the Supreme Court of the United States. Jersey Standard divested itself of control in such important companies as Standard of Indiana, Kentucky, New York, Ohio, California, Kansas and Nebraska, the Vacuum Oil Company, Anglo-American Oil Ltd., Chesebrough Manufacturing Company, Galena-Signal Company, Atlantic Refining Company, Prairie Oil and Gas Company, Union Tank Line Company and various pipe line systems.

It will be noted that, while the government decree was sweeping in its application to domestic properties, it left Jersey Standard with all its foreign companies but one. The alleged reason for the exception was that an officer of Anglo-American Oil was in New York when the court summons was

At the Fawley (Southampton) refinery a transporter has been built by Anglo-American to load ships with asphalt for export

At the London Terminal Aerodrome, Croyden, the Anglo-American have an aeroplane service station

issued and through this accident his company was included in the suit. Last year, however, Standard repurchased control of Anglo-American Oil from thousands of stockholders through an exchange of a guaranteed preferred stock.

Much of the business lost by Jersey Standard through dissolution it did not attempt to replace. The Chesebrough Manufacturing Company continued to make petroleum jelly without competition from its former parent. Jersey but recently began making oils and greases for special uses to compete with the Vacuum Oil Company, although, of course, it has for years done a large business in motor oil. On the other hand, it, and other Standard companies remaining after the decree, manufactured railroad lubricants on a scale which eventually reduced the operations of the Galena-Signal Company to minimum proportions.

Jersey Standard had to replace the important sources of crude oil represented by the Ohio, Prairie and California companies, its biggest producing units. It already owned the Carter Oil Company, which operated chiefly in Oklahoma, and, after dissolution, it acquired controlling interests in the Humble Oil and Refining Company, which operates in Texas, and founded the Standard Oil Company of

The Company's Lockheed-Vega plane made the record flight from New York to Buenos Aires in 55 flying hours

Louisiana, which developed production in Arkansas and Louisiana. Opportunely to the dissolution, the Mexican field began to boom. In that field Jersey Standard operated and still operates through the Transcontinental Company. In recent years, however, Mexican production has not been so important as in the earlier period.

The refining plants lost through dissolution were replaced by additions to the company's properties in New Jersey and at Charleston and Baton Rouge. The parent company's subsidiary, the Standard Oil Company of New Jersey (Delaware) now operates refineries in New Jersey, West Virginia, South Carolina and Maryland. Humble has its biggest refinery at Baytown, near Houston, Texas. The Standard Oil Co. of Louisiana operates one of the country's largest plants at Baton Rouge.

Standard of New Jersey, Standard of Louisiana and Humble all have their own producing, refining and marketing organizations. These marketing organizations replaced those lost to Jersey Standard through separation from former units. The three subsidiaries also developed pipe line systems of their own.

It has been said that, with the exception of the Anglo-American company, which did a business in the British Isles, the foreign companies of Jersey Standard were unaffected by the decree. It should be noted, however, that through the loss of Standard of New York, Jersey Standard surrendered the big export markets in China, Japan and India. By its separation from the Vacuum Oil Company it lost the Australian market. Standard of New Jersey never has sought to regain these markets.

Thus, a few years after the anti-trust dissolution, Jersey Standard was producing oil in the United States on a large scale and also in Mexico, South America and Russia. It was buying about one-half its crude requirements from other Standard companies and from independents. Its domestic marketing had been

Bahia Blanca—West Indian Oil Company's service stations are familiar landmarks in South America

reorganized and enlarged and it was pushing its business in the foreign fields it served.

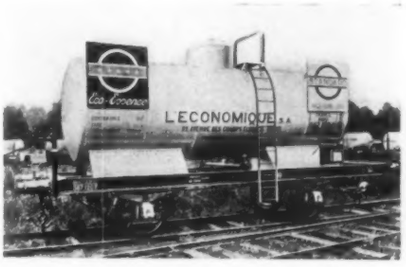
Developments by Jersey Standard since the war include the exploitation of foreign producing fields, participation in leadership in the improvement of manufacturing processes developed in the United States and Germany, development of new refined products and a large share in the still immature natural gas industry.

Two considerations caused Jersey Standard to increase its foreign production after the war. The conflict had demonstrated the value of oil to national welfare in peace and to safety in wartime. In consequence, Great Britain determined to assure itself of sources of supply under its control. On its side, the United States entertained fears that its domestic supplies were showing signs of attrition. The post-war "race for oil" resulted.

Another reason for Jersey Standard's excursions abroad after the war was the situation in Mexico. Civil turmoil in that country had long made operations there a source of trouble to foreign companies. When peace was restored in Mexico, its administration put in effect laws and taxes which the oil companies found most onerous. Even had there been no "race for oil," it would have been natural for foreign oil companies to look to other countries than Mexico. Production in Mexico since the war has declined and there has been little or no attempt to open new fields in that country.

After some negotiations with the Dutch government, Jersey Standard obtained producing areas in the Dutch East Indies. The search for oil in another part of the world ended in diplomatic fashion when Jersey Standard organized an American group, the Near East Development Company, to share equally with the British, Dutch and French in the control of the Turkish Petroleum Company, Ltd., holder of rights in the Mosul region, and now known as the Iraq Petroleum Company. The American participation is shared by Jersey Standard; the Atlantic Refining Company (owned by Standard of New Jersey before dissolution, but since then a competitor); the Gulf Oil Corporation of Pennsylvania, and the Pan American Petroleum and Transport Corporation, a subsidiary of Standard of Indiana.

Many service stations in Germany carry the sign of the Jersey Standard's subsidiary, Deutsche-Amerikanische Petroleum Gesellschaft

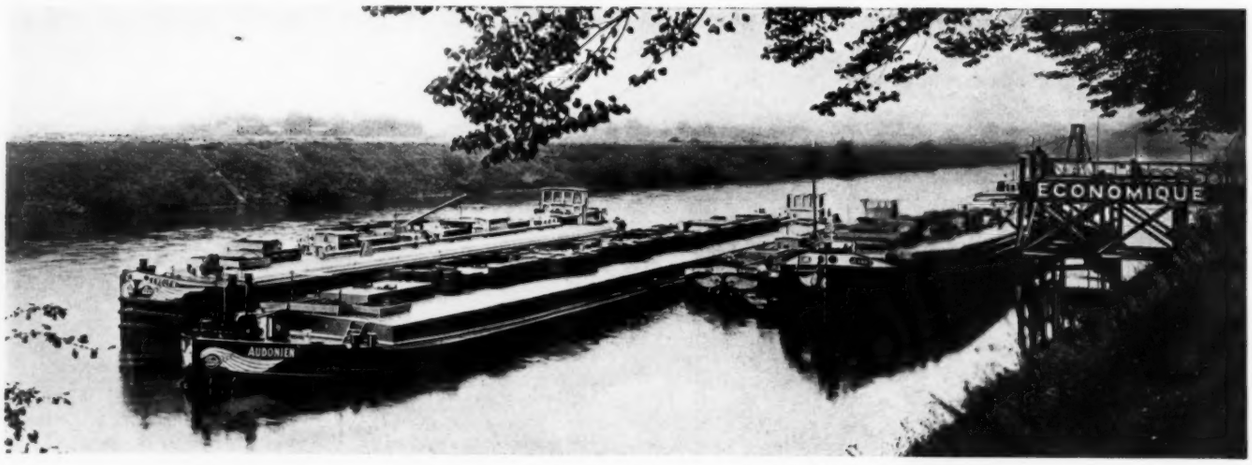


The railroads of France carry Standard gasoline

In Canada, Imperial Oil supplied airplanes to geologists and drillers and sent them in pursuit of oil, and while the feats they accomplished above the Arctic circle were not so widely publicized as those performed by some polar expeditions they were as difficult. These explorers discovered oil in the northern regions of the Dominion, although, as located, they are too far from markets for present exploitation. Imperial oil, however, has some light oil and gas production in the Turner Valley near Calgary, Alberta.

These foreign excursions completely changed the balance of Jersey Standard's oil production. Whereas, before the war, it had derived most of its crude from the United States and Mexico, in 1929 its foreign operations provided 49,442,000

Even in Copenhagen, Denmark, the motorist finds the Standard sign



Motor barges on the rivers and canals distribute Standard petroleum products in France

barrels of oil, almost equal to the amount of its domestic crude production in that year, which was 51,657,000 barrels. This increase in foreign production came largely from South America, Mexican production having dropped sharply. The figures are impressive in their comparison with the domestic total production of the United States when it is noted that large oil areas in Texas, Oklahoma and California augmented the domestic supply after the war.

As might be expected, Jersey Standard is in the forefront in respect to improved methods of manufacture. Some years ago Standard of Indiana developed the cracking process of refining, which permitted the extraction of a much higher percentage of gasoline and other distillates from petroleum. Jersey Standard employed the Burton process as devised by Standard of Indiana, but subsequently improved the original cracking process by devising the "tube and tank" method.

A step of far reaching importance was the obtaining by Jersey Standard of American rights to the hydrogenation process developed by the I. G. Farbenindustrie A.G. or German Dye Trust. The two companies signed a development contract in 1927 and in 1929 substituted an agreement for a definite and permanent merger of interest in hydrogenation. Standard (New Jersey) and Standard of Louisiana—as already described in previous issues of WORLD PETROLEUM—have established 5,000-barrel hydrogenation plants at Bayway, N. J. and at Baton Rouge, La. The Humble Company is building one at Baytown Texas.

Managers and department heads of the Jersey Standard's Argentine operations meet at Buenos Aires, South America

Hydrogenation is a remarkable catalytic chemical process that provides the most efficient form of refining known. Moreover, because it makes possible the conversion of coal into oil, it makes the world's coal reserves supplemental to existing oil reserves. While the cost of liquefication of coal is above prevailing oil prices, it is not prohibitive. The method contemplates the conversion into high-grade products of liquefied coal, shale-oil, coal tars, crude petroleum and its residues.

Jersey Standard believes that the hydrogenation method holds the secret to stabilization in the oil industry. To make the process available to other companies, it incorporated a patent-holding company to issue licenses under the patents acquired from Germany to oil companies in all countries outside of Germany. All American refineries whose operations are on a scale to warrant it have been offered options to purchase stock in the patent-holding company proportional to their refining capacity. This will provide for a division of the expense in obtaining the patents for American use and for a mutuality of license rights and management in the holding company. The Standard I. G. Company offers similar facilities to oil companies in other parts of the world.

Another striking chemical achievement in which Jersey Standard participated was the development of tetraethyl lead for the improvement of gasoline. Development and popularization of this form of gasoline was done in conjunction with the General Motors Corporation and the duPont interests. Jersey Standard shares with General

Lyons, one of the many Standard gasoline depots in France

Motors control of the Ethyl Gasoline Corporation.

Sulphuric acid is largely used in refining, and Jersey Standard owns the Bergenport Chemical Works at Bayway, N. J., which manufactures a considerable part of its requirements of the acid.

The company is steadily increasing its output of pharmaceuticals. It sells mineral oil for internal use and markets its own brand under the name of Nujol. Another of its pharmaceuticals is Mistol, used in the nose and throat. It owns Daggett & Ramsdell, Inc., manufacturers of facial cream, astringents and lotions. It makes Flit, an insecticide, and Molac, for the bathing of cattle. It also manufactures white oils in which apples are dipped for their preservation, motor car polish and oils for the smearing of confectioners' working tables.

As to the future of Jersey Standard, it becomes evident that the company not only will remain one of the giant oil companies of the world but that it is assuming an important place in the chemistry of petroleum. As Mr. Teagle said in an annual report: "One important effect of the adoption of catalytic hydrogenation methods by the oil industry, even on a small scale, will be to produce a more definite overlapping of the fields of the oil industry and the industries generally known as chemical."

This, then, is the company fathered by the elder Rockefeller which made the word "standard" a familiar expression in the American vocabulary. Abroad, its farflung properties retain their distinctiveness. The same quiet orderliness of operation which may be observed in the home offices at 26 Broadway, New York, is found also in the company's branches in distant climes.

A capitulation of Standard of New Jersey's properties reads like a geography. Among the companies it controls are:

Standard Oil Company of New Jersey (Incorporated in Delaware) operating refineries in New Jersey, West Virginia, South Carolina and Maryland. It has bulk plants, service stations and other marketing facilities in New Jersey, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina and the District of Columbia, and through the Carter Oil Company is a producer of crude in the Mid-Continent region; Standard Oil Company of Louisiana, producing, manufacturing and marketing in Louisiana, Arkansas, and Tennessee; Humble Oil and Refining Company, producing, transporting, manufacturing and marketing principally in the state of Texas; Imperial Oil Ltd., manufacturing and marketing throughout Canada; Anglo-American Ltd., in Great Britain; Standard Export Cor-

Fleet of Anglo-American truck chassis in London

poration; International Petroleum Company, Ltd., producing, refining and marketing in Peru and Colombia; Koloniale, producing and refining in the Dutch East Indies; Colonial Beacon Oil Company, refining and marketing throughout New York and New England; Standard Oil Co. of Penn., Standard Oil Company of Cuba, refining and marketing in Cuba; West India Oil Company, refining and marketing in the West Indies and Central and South America; Standard Oil Company of Brazil, marketing in Brazil; Pennsylvania Lubricating Company manufacturing and marketing greases; Romano-Americana, producing and refining in Roumania; Standard-Nobel, producing refining and marketing in Poland; Cia Transcontinental de Petrolio, producing in Mexico; Agwi Petroleum Corporation; refining in England, Tuscarora Oil Company Ltd.; Standard Oil Company of Argentine; Creole Petroleum Corporation, producing in Venezuela; Trinidad Oilfields Operating Company; Standard Oil Company of Bolivia; Stanco, manufacturing and marketing special products of petroleum such as Nujol, Flit and Mistol; Gilbert & Barker, manufacturing pumps, tanks and other dispensing equipment; Standard Shipping Company, owning and operating the fleet and other marine properties; Standard Oil Development Company, maintaining and directing the central research and technical laboratories, the engineering, chemical, patent and trademark staffs as well as coordinating like activities of the operating units; Ethyl Gasoline Corporation (one-half owned by General Motors), producing and marketing ethyl fluid for the production of anti-knock motor fuel; Oklahoma Pipe Line Company, Standard Pipe Line Company, and the newly built Ajax Pipe Line, owned by Jersey, Pure Oil Co., and Standard of Ohio.

The company owns wholly or in part, Hope Natural Gas Company, Interstate Natural Gas Company, Reserve Gas Company, Peoples Natural Gas Company, Clarksburg Light and Heat Company, Colorado Interstate Gas Company, East Ohio Gas Company, Columbia Natural Gas Company, Lycoming Natural Gas Company, and Connecticut Gas Company.

At Saint-Cloud on the road from Paris to Versailles

Twenty Years' Financial Growth

	Standard Oil Company 1911	Standard Oil Co. (N. J.) 1930
Stock outstanding	983,383 shares of $100 par	25,518,456 shares of $25 par
Net income	Not published	$595,742,924 (1929)
Dividends paid (at 40%)	$393,353	$50,000,000
Addition to surplus	Not published	549,223,220 (1929)
No. of shareholders	6,002	112,000
Earnings per share	Not published	$4.75 (1929)

Floating service station of the Jersey Standard's German subsidiary, the D. A. P. G., on a lake near Berlin

Ancient native oil refinery at Kirkuk, Iraq. Owners of seepages whence the crude is obtained, claim rights dating back 700 years

Photo. Fred. Kay

International News and Reports

OFFICIAL crude oil production figures for the Argentine for 1930 are 1,431,000 cubic meters or approximately 9,001,672 bbl.

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A refinery may be constructed near Brest, France, by the S. Brest-Port Petrolier, a company associated with the Pechelbronn. S. A. E. M.

▼

Due to an error in a last minute field dispatch the name of the H. L. Doherty Co. appeared in the last issue of WORLD PETROLEUM as "H. L. Daugherty and Co."

▼

At present there is no tax on motor spirit in the Irish Free State, and a recent proposal to levy a tax of four to eight cents is not meeting with approval in many parts of Ireland.

▼

The Colon oil concession, west of the southern end of Lake Maracaibo, Venezuela, which opened up for commercial production just over a year ago, has now almost reached the 2,000,000 bbl. annual output class.

▼

A large gusher broke loose in Big Lake field, Regan County, Texas, on March 12. Running wild with a flow of 10,000 bbl. oil and 75,000,000 cubic feet of gas, this 8,587 foot well had most of its casing torn out.

▼

A refinery of 400,000 bbl. annual capacity may soon be erected on the Mittland canal, Germany, by the State-owned mining enterprise Preussag, through its subsidiary the Elewerath Company. The new refinery will have a capital of about $700,000.

▼

The Third International Drilling Congress will be held in Berlin in 1933, probably in September. One of the objects of the Congress is the organization of national drilling committees in all oil countries. Members of the Congress will have an opportunity to visit the State Geological Institute at Berlin and the Technical Highschool at Berlin-Charlottenburg and to inspect highly important and extensive geological collections, which could not be exhibited at previous Congresses. Those wishing to attend the Congress should notify M. Laubsch, secretary, German National Committee, International Drilling Congress, Berlin SW 68, Alte Jakobstr. 18/19.

▼

Including royalty interests the total 1930 production of crude oil by the Gulf Oil Corporation of Pennsylvania aggregated 75,844,041 bbl., or 207,772 bbl. per day. Exclusive of royalties the output was 64,163,653 bbl.

▼

Hamilton Knight, M. L. A. chairman of the Shale Oil Investigation Committee, Sydney, Australia, recently stated that it had been definitely proved in a test by Air Commodore C. E. Kingsford Smith that shale motor spirit was of finer quality and could give greater car mileage than imported gasoline.

▼

"In no single instance," says Dr. W. G. Woolnough, geological adviser to the Australian Government, "can even the most detailed geological examinations carried out in Australian oil operations be compared in completeness with those regarded as an indispensable prerequisite in the United States. Australian technique is far behind."

▼

The American Association of Petroleum Geologists held its annual convention in San Antonio, Texas, from the nineteenth to the twenty-first of March. The rapid growth of the association during the fourteen years since its establishment is the most tangible evidence of the recognition of the importance of geology in the discovery and development of oil fields.

▼

"Salt water content in the oil fields in the Argentine may lead to the abandonment of extensive areas in Chubut," says the STANDARD of Buenos Aires, "as it has assumed alarming proportions, and is the most serious problem that the country's petroleum industry has to face. No general success has yet resulted from attempts at deeper drilling to reach new oil strata at lower levels. While the Comodoro Rivadavia field production has declined during recent years, the Plaza Huincul area has shown a marked advance, and the oil is of high quality. The Salta field operated by the Standard Oil Company of New Jersey's subsidiary has shown an increase except in 1930 when there was a slight drop in production."

▼

Crude oil production in 1930 by The Texas Company amounted to 42,033,877 bbl.—most of which was in the United States—or 16.6 per cent less than its production in 1929. The Company's crude runs to stills last year increased over 1929 by 2 per cent, and totalled 111,645 bbl. An average of 0.49 bbl. of gasoline was extracted per barrel of crude. The Texas Company holds 140,351 acres of exploration and exploitation concessions, and one-half interest in 679,568 acres, in Venezuela.

▼

A pipe line from the oil fields in the Falcon State in Venezuela to deep water at Chichiriviche in the Gulf of Triste, Northern Venezuela, was recently completed by the Tocuyo Oilfields of Venezuela. The pipe line crosses part of the oil concessions of the Pantepec Oil Company of Venezuela in Silva, State of Falcon.

The Union National Petroleum Company (Union Oil Co. of California) and the California Petroleum Corporation of Venezuela (The Texas Company) are drilling on the Pantepec concessions, Pantepec owning half the common stock of each of these two concerns. Silva No. 1 is being drilled under contract by the Drilling & Exploration Company, of Maracaibo, under the direction of Mr. Douglas and has made a showing of gas; while Leon No. 1, about eight miles away, is being drilled by the Martin Engineering Company under supervision of Mr. Park. The latter well at 2,680 feet came in as a big gasser on February 26 and caught fire by friction. The fire broke out between the 16 inch and 11¾ inch casing, burning the rig and draw works. It burned for nearly four days. A new rig will be completed early in April.

Oil found to date in the districts of Acosta adjoining the Pantepec properties, is of high quality, being 38 to 42 deg. Beaumé. During 1930, production in this area amounted to 22,500 bbl., of which 17,200 bbl. was exported. It is reported by the MARACAIBO HERALD that during the next four to five years the Union National Petroleum Company and the Californian Petroleum Corporation of Venezuela will each spend $3,500,000 in drilling and production.

Morocco's Possibilities For Oil

THE youngest among the great French properties in North-Africa, the Morocco Protectorate, is of a peculiar importance for France. While Algeria and Tunesia are chiefly agrarian countries, the French hope to industrialize Morocco. Without doubt this country has a rich store of industrial raw materials of various kinds, especially phosphate-containing ores, zinc and lead; also coal fields have been discovered there. The French colonists have been particularly delighted by the fact that traces of oil also have been encountered in those parts.

Although, by the re-annexation of Alsace, France has been enabled to enlarge its production basis (the Pechelbronn oil fields), it is still lacking sufficient oil, and has to spend about 600,000,000 gold francs annually on oil imports. For this reason the French Colonial Administration is making strenuous efforts to open new oil fields in the French colonies. Until now the results in North Africa have been quite poor. In Algeria about 10,000 bbl. of oil a year have been produced for a time, while in Tunisia, where the French believe they have discovered two important oil areas, the results have been even more discouraging. The test drillings, operated mostly during the world war in the valley of the Chélif, proved to be so unproductive that no one can expect commercial production, and today hope has been given up for any serious possibility of getting oil.

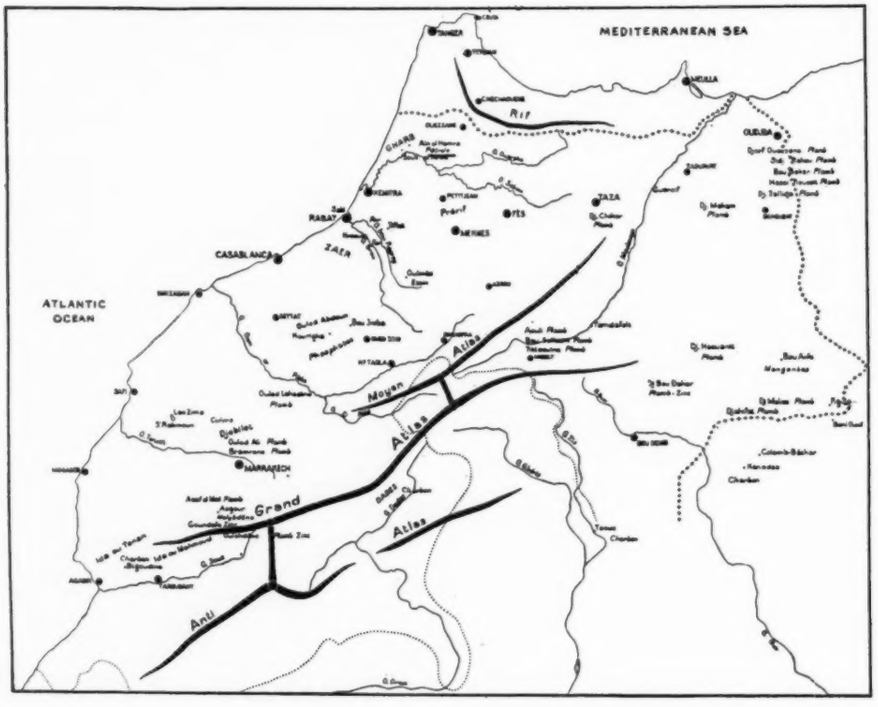
Operations in the Morocconian territory have been more successful, but not, however, in the districts near the great desert on the border of the salt lakes where formerly hydrocarbonides were expected. The north-west of the French Morocco-Zone, which is particularly favored in the way of transportation, situated not far off the Atlantic coast, north of the booming cities Kenitra and Rabat, the latter the seat of the Morocconian government, is generally regarded as the most promising oil area.

In this district, called "Gharb," a number of wells have been drilled. At Ain el Hamra, near Souk el Arba, a well was sunk 9,000 ft. which tapped several oil horizons, the most productive being located at 7,200 ft. depth. The pump tests yielded a daily production of about 200 to 250 Litres. Other prospecting has been done north of Meknes near Tselfat. Commercial production has not yet been established. Morocco itself still imports its entire oil demand of about 120,000 bbl. a year at the cost of 4,500,000 gold francs, of which supply about two-thirds are imported from the United States. French geologists, however, look upon the district of Gharb with some expectation.

To speed up industrial activity in Morocco the French Colonial Administration has adopted a concession system. Principally, only the hauling of phosphates is reserved in the State, while for the exploitation of other mineralogical products, including petroleum, concessions are granted to private persons, and also to non-French prospectors. Usually the State reserves a participation for itself. The concessions on hydrocarbonides run seven years for wildcatting and thirty years for development and production.

RICHARD LEWINSOHN.

Map of Morocco



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Purchasing Oil Equipment

(Continued from page 273)

visit foreign fields, or establish agencies abroad. If their motive is as just described, well and good, but if their sole desire is to boost their business, viewed in the light of their client's interests, they can hardly expect to arouse much enthusiasm for them as fulfilling any specially useful purpose. Some oil fields overseas have no facilities for accommodating strangers at all. In the majority of others the success of a visit is greatly dependent on the hospitality of the various companies in affording means of getting about, and even on occasions in providing bed and board. In view of this manufacturers would be well advised to consult their prospective host's interests as well as their own when projecting one of these trips.

Strange that this age of machinery, with all its dependence on mechanical and material devices, has demonstrated more forcibly than any that has preceded it that the secret of success is co-operation. Co-operation is therefore an entirely modern product. Because co-operation unites divergent interests, making them work as one, it is the most natural and powerful agency for good yet discovered. On it the future prosperity of the world depends.

▼

Iraq Pipelines

THE Iraq Government and the Iraq Petroleum Company have signed the agreement for the latter to construct the bifurcated pipeline from the Iraq oilfields to Tripoli and Haifa. The contract is subject to ratification by the Iraqi parliament. Work on the line will be commenced without delay.

Machinery for Deep Well Drilling

In the Second Section of a Paper Read on March 20 Before the A.P.I. Pacific Coast Division, A. F. Wilson Discussed Drilling Equipment Improvements at Kettleman Hills.

In the early development of the Kettleman Hills field the drilling machinery and attendant equipment were new and consisted of the most up-to-date material available. During the past year, it has been possible for many of the operators to carry on development work with used equipment. This eliminated the acquirement of any new drilling machinery of recent design.

Aside from certain improvements on various parts of the equipment, there has been little recent development in drilling machinery in Kettleman Hills.

These improvements, which have done much to facilitate the operations of the rig, are as follows:

Rotary Machinery

Due to the large available supply of fuel gas, steam is now the universal power used for drilling in Kettleman Hills. In order to develop and transmit this power, there are two types of rotary machinery in operation. One is the twin engine and four-speed draw-works, while the other is the hydraulic feed table and mine hoist, driven by a three cylinder vertical steam engine.

Owing to the deep drilling encountered, the rotary machinery should be heavy and powerful. It is safe to predict that most of the future development will be along these lines. Many of the companies have already adopted the 12 inch by 12 inch horizontal twin engine.

Water-Cooled Drum. In order to design a rotary drum that would allow close adjustment on the braking mechanism, thereby obtaining a more uniform braking action, it was necessary to limit the heating of the brake drum when operating with heavy loads at high speeds.

This was accomplished by making the proper connections at each end of the drum shaft and allowing water to circulate through the enclosed drums. If there is a supply of water available, having the proper pressure, the discharge from the drum is conveyed to the feed water tank at the boiler plant. If such a supply is not available it is necessary to set a pump, construct a cooling tower, and circulate the water.

Improved Self-Energizing Brake. This brake, which is a modification of the regular self-energizing type, is reliable, easy of operation, and with a minimum possibility of kicking. A compound linkage connects a crank, controlled by the hand lever to the cranks which provide tension in the bands. The arrangement of the linkage allows a variation of the amount of motion in the bands as the position of the hand lever changes. As it is lowered, the band crank moves a shorter distance per unit of lever travel, and the braking becomes more sensitive.

The brake is equipped with an equalizing bar, which works from the back end of the bands. The bar is pivoted in the center, the pivot being connected to the derrick base.

Steam-Operated Engine Reversing Mechanism. This device consists of a piston enclosed in a cylinder which has an inlet and an outlet steam valve in each end. It is mounted on the steam intake manifold of the engine in such a manner that a short throw of the throttle wheel shaft operates one of the valves in the end of the cylinder, permitting steam to enter, and causing the piston to throw the link.

In addition to being a labor saving device, the mechanism has an important safety feature, in that it is capable of centering the link. This is accomplished by an auxiliary lever. Valves open two discharge ports located near the center of the cylinder, and the lever simultaneously opens the closed inlet port in the end of the cylinder. This operation permits the piston to center, for in that position, the pressure is equal on both sides of the piston.

The auxiliary lever is operated from a safety cathead feature which will center the engine in case the cathead becomes fouled. A trip placed in the derrick makes it possible for the derrickman to center the engine, and also prevents running the traveling block into the crown.

Balanced Throttle Valve. The balanced throttle valve is easier to operate than the slide type, and has the added safety feature that when the valve is closed, an auxiliary port on the downstream side of the throttle valve prevents the pressure from building up within the intake manifold of the engine.

There are two types of valves in use at the present time. In one type, the plug is shaped like a spool and when closed, the valve positively operates a small poppet valve on the downstream side. The other type has a piston which balances a disc-shaped valve. The piston operates in a cylinder open between the upstream and downstream sides. When closed, a small relief port is opened by a movement of the stem.

Cable Tool Machinery

A few years ago the cable tool machinery was the most important power assembly on the drilling wells. It supplied the power for operating the cable tools; was used to make up and handle the casing; operated the sand reel when bailing, and at the end of the flowing life of the well, supplied pumping power.

Development of heavier rotary machinery eliminated the cable tool machinery for handling the casing.

This fact, together with the long flowing life of the wells in Kettleman Hills, and the question as to the method or type of equipment eventually required to produce these wells, has caused many of the operators to replace the cable tool machinery with more portable equipment.

One type of this equipment consists of a reconditioned, No. 5, draw-works, which is installed on the side of the derrick opposite the rotary machinery, and driven by a 10 inch by 10 inch twin steam engine. During the regular drilling operations, the dead end of the casing line is spooled on the drum. In order to bail, however, it is necessary to remove the end of the casing line and spool the sand line. In setting casing, the joints are spun in by hand, and then made up with casing tongs, using

(Continued on page 293)

Gas Influence on Deep Well Pumps

Working Efficiency of Pumps Operating Deep Wells Functioning Under Gas Pressure Form Interesting Engineering Study.

From the Russian of A. Fedoseev

IN the operation of deep well pumps for the production of crude oil from wells under gas pressure it has been found that there are many obstacles which influence the working efficiency of the pumps, or rather the coefficient of filling of the pump. A thorough study of conditions has naturally helped a great deal to solve this problem. However, among all the factors which influence the working efficiency of the pump the influence of gases which are present in the oil wells are the most important and have been the least studied. The man in the field knows how troublesome and costly the influence of the gases may be on the working efficiency of the pump.

There are two forms of gases present in the well: dissolved gases and free gases. Research has been based on the supposition that the main influence is exerted by the dissolved gases in the liquid. Several tests made at the oil fields of the Azneft oil trust in Russia have proved that the working efficiency of the pumps under the circumstances are mainly influenced by the free gases, the appearance of which at the wells is caused by lowering the liquid level in the well or through the presence of a gas dome.

A study has been made on the influence of both forms of gas, and the results are quoted for each case separately in order to make a comparison.

Influence of Dissolved Gases

The filling coefficient of the pump is low and the discharge of the pump is practically

100m, D = 0.056 m., S = 0.457m, L_n = 1.21m., d_n = 0.0762m., L_n = 0.4m., d_m = 0.016m, L_m = 1.15 m., γ = 0.86. Where H is the liquid level in the well, h the pumping depth, S the plunger stroke in meters, D the plunger diameter in meters, L_p the plunger length in meters, d_n the diameter of the nipple, L_n is the length of the nipple, d_m the stock diameter, L_m the stock length in meters, and γ the spec. gravity of the oil.

Experiments made with various grades of oil have shown that they have a tendency to absorb gases of all kinds including hydrocarbon gases. It has been established that 0.001 m^3 of oil of 0.88 spec. gravity at + 43° C. and P = 9.6 atmospheres pressure will absorb 0.004 m^3 of gas. Assuming that at h = 100 (which is the depth of the pump at the well) there are no free gases as they have been completely dissolved in the oil, the pressure of the well at this depth will be

$$P_{abs} = \frac{h\gamma}{10} + 1 = \frac{100 \times 0.86}{10} = 9.6 \text{ kg/cm}^2.$$

When the pump is lowered into the well to its extreme position the volume of dead space will be

$$V_o = \frac{\pi}{4}(D^2 L_P + d_N^2 L_N^2 - d_M^2 L_M) = \frac{3.14}{4}$$
$$(0.056^2 \times 1.21 + 0.0762^2 \times 0.4 - 0.016^2 \times 1.5)$$
$$= 0.005 m^3$$

This space will be filled with oil in the pipe at the same height h = 100. At the upward movement of the plunger the liquid will enter the pump through the suction valve and will fill the space under the plunger. When the plunger passes its stroke S = 0.457m., the quantity of oil will have a volume

$$V = \frac{\pi D^2}{4} S = \frac{3.14 \times 0.056^2}{4} \times 0.457 = 0.0011 m^3$$

Hereby the liquid column is raised through the height S = 0.457m. At the downward movement of the plunger the receiving valve will close while the discharge will open and the plunger passes the liquid, which is immovable.

If the hydraulic resistance caused by the oil under the plunger at its upward stroke and the loss of pressure due to imparting of velocity to the liquid are disregarded, no gas separation would occur at the upward stroke of the plunger and the coefficient of the filling of the pump would be = 1. However, the upward stroke of the plunger will cause a decline in the pressure underneath, which may be assumed to be 0.5 kg/cm². Thus the oil present in the dead space as well as the oil coming from the well level through loss of pressure

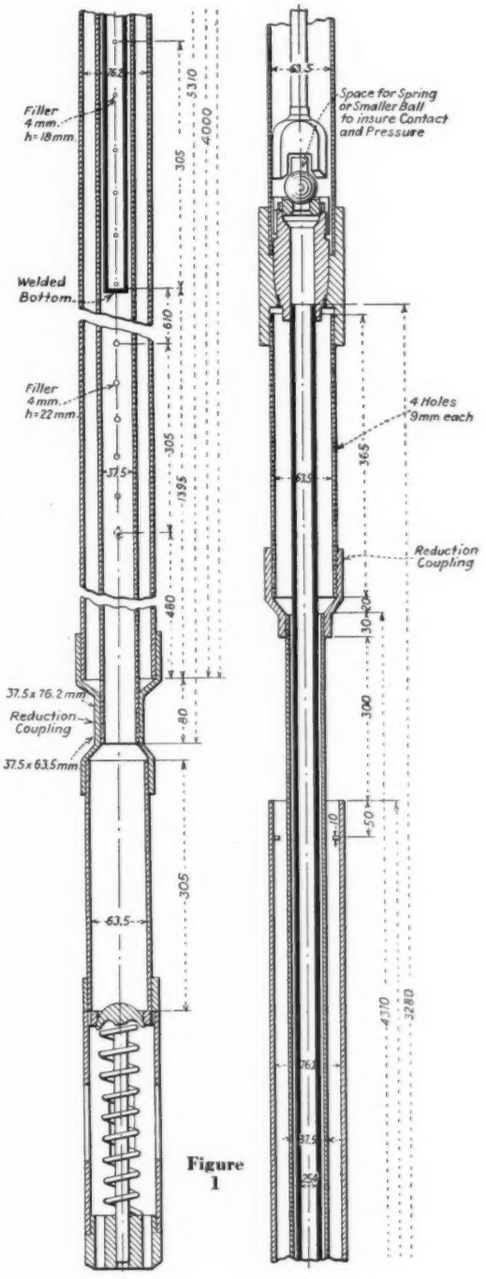

Figure 1

from 9.6 to 9.1 kg/cm² will separate gases, the volume of which will be determined from the difference between the volume of gas dissolved in the oil at 9.6 and 9.1 kg/cm², which will be, at the same time, the coefficient of the filling of the pump. It is evident that this volume is lowest when the depth of the pump is greatest and when the dead space is smallest.

At the downward stroke of the plunger under the pressure of the liquid above, the pressure under the plunger will increase. When it reaches 9.6 kg/cm² the separated gases will again dissolve in the oil (the plunger will pass part of the way which corresponds to the volume of the separated gases when

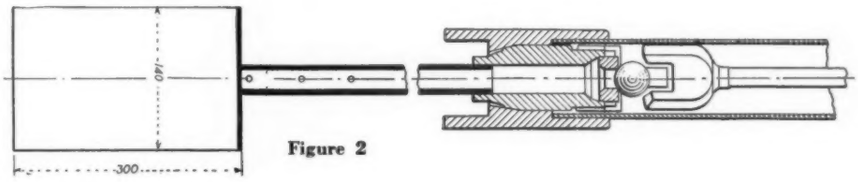

Figure 2

reduced to 9.1 kg/cm² pressure), and the oil will regain the quality it had while in the well. At the further movement of the plunger the valve will open, the plunger will pass the column of oil and will reach its lowest position.

At the next upward movement of the plunger a new partial gas separation will be repeated as the oil, under the plunger, remains of the same quality. While the dissolved gases have but little influence upon the working efficiency of the pump, disturbances are encountered where the coefficient of the filling of the pump is practically = 0, and this is undoubtedly due to the presence of free gases which may at times reach very large quantities.

Influence of Free Gases

When the plunger begins its upward movement the suction valve will let into the pump cylinder a stream of liquid with gases. The gases are mixed with the liquid and flow in the form of bubbles, and on passing the pump filter they are dragged along into the pump cylinder. This is true of course, when the velocity of the gases is lower than the velocity of the liquid, otherwise the gases will freely pass the filter and escape before they reach the pump cylinder.

Tests have been conducted at the oil fields of the Azneft with various types of pumps of (45 mm.) to (73.5 mm.) diameter at a depth of 600 feet and a liquid level in the well of 750 feet (general depth of well 2,200 feet, diameter of column 152.4 mm. and filter length 255 feet), where the coefficient of the filling of the pump was nil and consequently no production was forthcoming.

Counter tests have been made recently with a 56 mm. diameter Axelson-type pump provided with a gas anchor, the construction of which is shown by Fig. 1, where the oil enters the open end (at AA) of the pipe and moves down along the space of the ring to the opening BB. While the liquid moves on and changes its direction, the gases which are carried along, separate, and being of low gravity they go up and escape through the opening. The liquid enters the opening D of the filter and flows through the receiving valve into the cylinder of the pump. At a liquid level in the well of 825 feet, the depth of the pump in the well being 685 feet with a daily production of about 100 bbls. of crude oil and about 60 bbl. of water, the coefficient of the filling of the pump reached the average of 0.740.

Fig. 2 shows a similar simplified gas anchor construction where, instead of the outside filter, a cylindrical rod is welded to the valve filter which tends to prevent the free gases from entering the cylinder of the pump. This gas anchor, working with the Axelson pump as described above, has improved the coefficient of filling the pump under similar well conditions from 0 to about 0.525.

It thus has been established that only the free gases and not the dissolved gases, are detrimental to the working efficiency of the pump, and that it is much easier to prevent the free gases from entering the pump cylinder than to remove the gases after they have entered. All efforts which have been made to remove the gases after they had entered the cylinder of the pump have only tended to complicate the construction of the pump as well as its working, and have proved to be very costly to oil field operators.

Chinese Kerosene Market

(Continued from page 260)

as *Mei Foo* formerly held 80 per cent of the business going to Americans, compared with its present 50 per cent. Today the Asiatic Petroleum Company (Royal Dutch-Shell) controls 25 per cent of the Chinese kerosene market, and The Texas Company has secured 18 per cent. Independent Chinese merchants handle but 7 per cent of the trade.

THREE YEARS' KEROSENE IMPORTS INTO CHINA

(U. S. Department of Commerce Figures)

Country of Origin	1927 (bbl.)	1928 (bbl.)	1929 (bbl.)
United States	3,041,179	4,849,729	4,000,000
Neth. E. Indies	164,373	394,582	967,000
Hong Kong*	647,936	817,094	.....
Russia	43,771	62,050	27,000
Japan	41,139	28,250	.....
Others	67,083	115,272	883,000
TOTAL	4,005,481	6,266,977	5,877,000

* British colony island; transhipments.

The extent to which Russia is increasing her kerosene production has already been outlined in WORLD PETROLEUM; but the Soviet Oil Syndicate has for the most part avoided competition with New York Standard's or Vacuum's markets.

During the fiscal year 1929-30 Russia's exports of kerosene aggregated about 8,000,000 bbl., of which the major part was purchased by the following companies:

Company	Approx. Quantity (bbls.)
Medway Company	2,000,000
Anglo-American (Std. of N. J.)	400,000
Standard Oil Co. of New York	1,755,000
Vacuum Oil Company	1,120,000
Other Standard Affiliations	75,000
TOTAL	5,350,000

The balance of 2,650,000 bbl. was marketed by the Soviet Oil Syndicate's own sales organizations. J. WEGRIN.

[WORLD PETROLEUM cabled Sergius M. Ganshin, chairman of the Soviet Oil Trust in Moscow, to confirm or deny the Associated Press report that the Trust has contracted with a Chinese company for large supplies of kerosene. Mr. Ganshin replied that he regrets he is unable at present to supply the required information.—EDITOR.]

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Deep Drilling Machinery

(Continued from page 291)

the regular rotary drilling machinery.

The usual type of cable tool machinery, consisting of the steam engine, sand reel, and band wheel assembly, including one or two installations of special rig fronts, is still being used quite extensively in Kettleman Hills field.

World Production of Natural Gasoline

NATURAL gasoline production in 18 important countries of the world increased by 40 per cent in three years, gaining 16,730,288 bbl. In 1927 the total output amounted to 41,470,069 bbl., and by the end of 1929 had reached the figure of 58,200,357 bbl. Information on 1930 production is not yet available. In 1929 the United States as in other years, was easily the largest producer, having an output of 53,183,048 bbl. Among crude petroleum producing countries the following reported no natural gasoline; namely, Czechoslovakia, Ecuador, Esthonia, France and Germany. These figures are from a survey recently completed by E. B. Swanson, chief petroleum economist of the U. S. Bureau of Mines, Department of Commerce, at the request of a number of American oil companies.

In countries outside of the United States the growth of natural gasoline manufacture is shown in the following table:

Growth of Gasoline Manufacture

Country	1929 (bbl.)	1927 (bbl.)
Netherland East Indies	1,333,926	779,143
Peru	726,190	415,555
Persia	696,730	190,105
Rumania	476,000	167,000
Russia	361,000	185,800
Poland	327,798	263,948
Colombia	329,358	77,505
Venezuela	311,764	83,520
Argentina	142,311	20,974
India, British	99,888	79,704
Japan	77,324	67,798
British Borneo (Sarawak)	76,235	22,678
Egypt	21,162	16,855
Mexico	18,759	13,461
Taiwan (Formosa)	15,000	5,026
Trinidad	3,864	.....
Canada	.....	6,140

In 1928, gasoline production, in all countries except Trinidad, showed a steady gain over 1927, and 1929 increased in a similar proportion over 1928.

Of the production reported for the Netherland East Indies during 1929, approximately 600,000 bbl. were mixed with crude and the balance transported to refineries for blending in the production of motor fuel. All of the production for Peru was produced at La Brea, Parinas, and Lobitos, and blended with gasoline at Talara refinery.

The Persian production is blended with crude in the field, and transported by pipeline to the Abadan refinery, the natural gasoline being included in the regular reports of crude oil production.

In Rumania, Russia and Poland natural gasoline is handled almost entirely apart from crude oil and the output is not included with crude oil production.

Colombian production and virtually all of that in Venezuela is mixed with crude oil and included in the figures of crude oil production. Argentine production is shipped to refineries and is not included in the crude oil production figures.

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French to Drill in Colombia

FORMATION of the S. Europeenne des Petroles on February 27 with a capital of 13,500,000 francs has been announced in Paris. The aim of the company is to exploit concessions in Colombia and Morocco. It has been formed under the auspices of St. Gobain.

Several well known Parisian personalities are on the board of directors, such as Pierre Dupuy, president (co-proprietor of the PETIT PARISIEN); M. Parent, vice president (administrator of the Manufactures de Glaces & Produits Chimiques de Saint Gobain, Chauny & Cirey). E. L. Guernier, managing director. Other administrators are, Thureau Dangin, Bouvat-Martin, R. Schlumberger, René Tatur, and Jean Mercier.

There have been issued 27,000 shares of 500 francs each, of which 15,600 go to St. Gobain, and 3,000 to the Cie de Berre in remuneration for their assets. The latter consisting chiefly of drilling contracts, and concessions in Colombia totalling 5,000 hectares, and 12 permits to drill for oil in Morocco. Furthermore, 10,000 founders shares have been issued of which 4,000 also go to St. Gobain.

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NORTHCUT ELY has been appointed as a member of the Technical and Advisory Committee of the U. S. Federal Oil Conservation Board.

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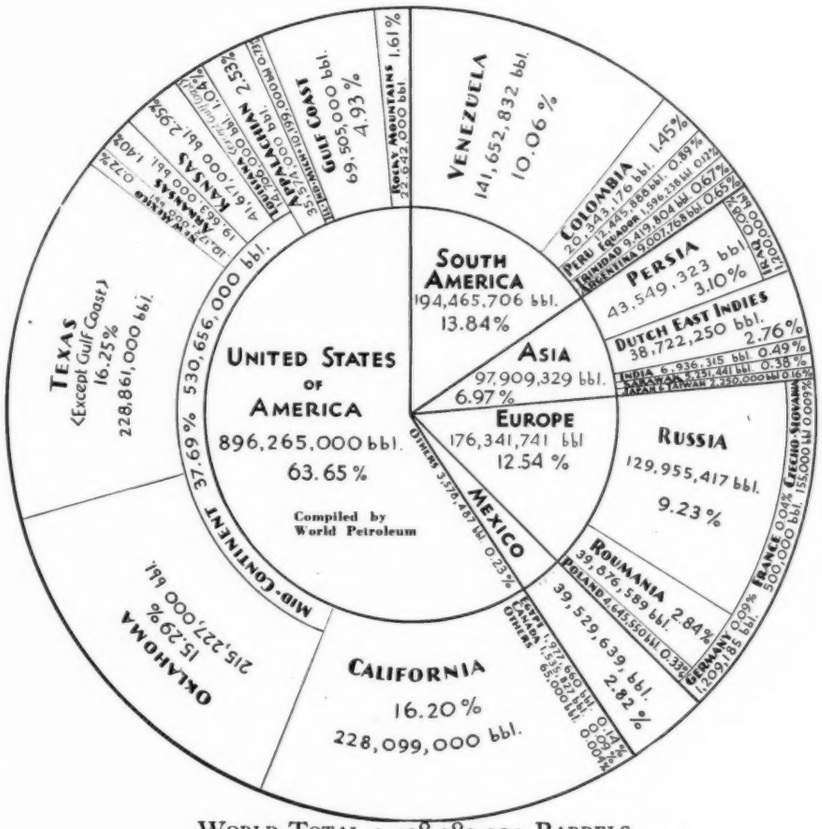
ANALYSIS OF WORLD'S CRUDE OIL PRODUCTION
1930



WORLD TOTAL 1,408,089,902 BARRELS
Conversion Basis, 1 Ton = 7 Barrels

Canada's Petroleum Industry, 1930

PRELIMINARY figures regarding the 1930 domestic production of crude oil, and the imports of crude and refined petroleum products are to hand from the Canadian Dominion Bureau of Statistics of the Department of Trade and Commerce. Crude oil production of 1,492,471 bbl. valued at $4,953,885 last year recorded an increase of 33.5 per cent in quantity and 32.7 per cent in value over the 1929 output. Of this output Alberta wells yielded 1,368,411 bbl., Ontario wells produced 117,302 bbl. and wells in New Brunswick 6,758 bbl. Crude production in 1929 amounted to 1,120,693 bbl., value $3,790,497.

Natural gas also set up a new high record in 1930, when 29,104,570,000 cubic feet were produced, Alberta accounting for 70 per cent. Experimental work with gas storage in exhausted oil sands was carried out in the Bow Island field.

Exports of crude and petroleum products from Canada during 1930 amounted to 808,359 bbl. valued at $2,441,632, plus 1,899,296 lb. of wax. Of this, crude oil accounted for 550,273 bbl. valued at $881,452, compared with 805,071 bbl. valued at $1,548,288 in 1929. Total value of exports amounted to $2,441,632 in 1930 and $2,728,072 in 1929.

Imports of crude and refined products into Canada during 1930 were as follows:

Product	Barrels	Dollars
Crude Oil	31,054,345	41,362,227
Kerosene, fuel, and illuminating oils	1,044,218	1,196,347
Lubricating oils	465,993	5,017,752
Gasoline and other oils	4,678,671	17,245,825
Other products	.....	978,073
Totals	37,243,227	65,800,224

In 1929 the total value of imports amounted to $76,886,930. Although the quantity of crude oil imported was only about a million barrels greater, namely, 32,266,254 bbl., than in 1930, its value was much higher, being $49,075,897.

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Impressions of New Colombian Law

(Continued from page 262)

import duties on their equipment nor subject them to any income tax, whereas in Colombia the oil industry, besides paying royalties or production taxes, is subject to all the forms of taxation laid on any and every other industry.

Objection has also been raised to the provision requiring privately produced oil to pay a sliding tax with maximum 8 per cent, while oil produced on public lands pays a sliding royalty with maximum of 11 per cent. This seeming advantage given to private owners disappears when the lessee of such lands has to pay the owner royalties in addition to the government tax.

Another provision of the law expected to cause foreign capital to hesitate before embarking in a quest for Colombian oil, is that which requires operation of the wells at 25 per cent of the maximum capacity. The capacity is to be ascertained by arbitration, but in any event the Government is to receive its royalty based on a minimum of one-quarter of the maximum capacity. It is held that this provision may create unforeseeable liabilities, due to changing economic conditions, under which loss could not be avoided, except by shutting down entirely or resulting in piling up useless surplus stocks.

Another condition described as a burden is the provision which does not allow the operator to relinquish blocks of his concession smaller than 5,000 hectares, thus binding him to a considerable outlay for rent on unprofitable holdings.

Representatives of the oil companies have pointed out that a number of provisions would be harmless if the law is administered in a spirit of helpfulness and good will, but which in the future could be used as instruments of oppression by unfriendly officials. One of these is the obligatory turnover to the Government, by operators of private lands, of all scientific and technical data which the government may consider necessary to complete its geological and geophysical records. This makes it possible for valuable information acquired at great expense to fall into the hands of competitors. The law obliges the contractor to begin exploitation within six years from date of contract, should he have found production, or his concession can be annulled by the Government. The Government, also, retains the right to approve or reject applications for the construction of pipe lines, the rejection, however, limited to technical reasons only. Obligatory arbitration of differences of opinion between the Government and the operators is held to be a disadvantage, because the operator may often expect a minority representation.

Some owners or lessees of reputed oil lands are disturbed over the provision in the law affecting exploration and exploitation on private lands. They foresee endless litigation over the titles to said lands in the application of this law and which thereby would not be helpful in fostering oil development in Colombia. If the Government officials consider the proof of title inadequate the matter will be referred to the Supreme Court for an advisory opinion. If the Court also is not satisfied with the proof, the owner is then obliged to bring suit against the nation to clear his title. This may be unavoidable in a country where land titles are in such a chaotic state, but it is one of the elements of uncertainty that face the capitalist who ventures into the Colombian oil fields today.

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French Oil Debate

FURTHER discussion of the proposed ratification of the 1924 agreement, granting to the Compagnie Française des Petroles, France's 23¾ per cent interest in the exploitation of the Iraq oilfields, was approved on March 25, in the Chamber of Deputies by a vote of 340 to 140. Deputy Forgeot suggested an entirely new agreement by which the State becomes an ordinary shareholder. This plan received the approval of the Ministers of Commerce and Finance, Loucheur, and M. Herriot. The latter demanded that the State's participation be raised to 40 per cent.

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New Absorption Plants

THE Pure Oil Company has placed an order with the Foster Wheeler Corporation covering the fabrication and erection of two complete absorption and stabilizer plants. One of these plants is to be located at Marcus Hook, Pennsylvania, and the other at Smith's Bluff, Texas. A rather novel method of taking care of the non-condensibles will be used. The Marcus Hook unit will handle 6,000,000 cu. ft. of gas per day at 65 lb. per sq. in. pressure, plus 5,000,000 cu. ft. at 35 lb. pressure. The Smith's Bluff unit will handle 8,000,000 cu. ft. at 65 lb. pressure, plus 5,000,000 cu. ft. at 35 lb. pressure.

SHIPPING

London: Prospective Orders

AFTER a period of depression in which orders for new tanker tonnage were very conspicuous by their absence it now appears that within the very near future there may be a slight lifting of the clouds. At the time of writing the Burmah Oil Company is taking bids on a new tanker of 5,000-6,000 tons for its coastwise service. Like most of the other ships in the fleet of this company, she will be steam propelled, one reason being that the engine room is manned by native labor in running on the coast. There is keen competition among British shipbuilders to whom this order is restricted.

At the other end of the scale there is a small tanker for coastwise purposes for the National Benzole Company, the order for which will probably have been placed by the time this appears in print. This vessel is another of an increasing number of small coastwise tankers with Diesel propulsion which have been placed in Great Britain during the last eighteen months or so. The Anglo-Saxon Petroleum Company has also placed an order for a small tanker with a Clydeside firm. It is rumored that the Anglo-American Oil Company will shortly be in the market again. A chance phrase let drop by an Anglo-American official recently was construed by certain Tyneside papers to be a strong hint that a local yard would shortly be favored with a new Anglo-American order. The Standard Transportation Company recently took bids in the United States for two twin-screw, Diesel-driven, coastwise tankers of 15,000 bbl. carrying capacity. One already has been ordered from the Bethlehem Shipbuilding Company's Sparrows Point Yard. She will be equipped with McIntosh & Seymour Diesel engines.

Launches and Completions

SHIPYARDS in Great Britain are still reasonably well-occupied in the completion of existing tankers. Sir Basil Kemball-Cook, managing director of the British Tanker Company stated at the recent launching of the BRITISH STRENGTH, that the present depression as far as tanker building is concerned is likely to last for some little time. Consumption of oil is bound to increase, he thinks, and when the present depression has been partly worked off there will be further orders coming forward. The BRITISH STRENGTH is the last of three tankers placed by the British Tanker Company with Palmers' Hebburn Yard at the beginning of 1930, the other being the BRITISH SCIENCE, and the BRITISH SPLENDOUR. These vessels have a d.w.c. of about 10,250 tons and a speed of 11¼ knots on 10¼ tons of oil per 24 hours for all purposes, when drawing 25 feet 9 inches. They are single screw vessels propelled by Doxford Diesels developing 2,850 horsepower at 84 revolutions.

One of the most noteworthy tanker events is concerned with the Anglo-American Company and Palmers' shipyard, and is the launch of a new center section of over 300 feet length for the large steam-driven bulk-oil carrier SARANAC. This ship arrived at Palmers' plant on January 17, of this year, was placed in dry dock and cut into three pieces in way of the forward and after cofferdams. The new center section was launched on February 3, and it is expected that the tanker will be completed and handed over to the owners within two months of the date of the docking. On the removal of the old center portion, the new section was docked and the existing forward and aft ends carefully set into position to ensure the entire elimination of any possible distortion of the complete structure when the parts were joined together. It will be recalled that similar work was done on a sister ship, the CADILLAC, last year. It is estimated that to repair vessels of this type in the ordinary way would entail laying them up for four months, whereas the reconstruction can be carried out in two months. It is pointed out that the advantage of reconstruction of this nature is that the new midship portion can be built at the yard, while a vessel is still at sea and in service. She need therefore only come alongside for the "surgical operation" at the very last moment.

Corrosion of Tankers:

THE question of corrosion of tankers is occupying the serious attention of superintendents of tanker companies. If the reconstruction of centre portions continues, then, unquestionably, it will be a very good thing for shipyards. One can imagine that shipbuilders will do all in their power to encourage the practice in these otherwise lean times. The excuse has been made on behalf of "centre section" construction work on certain wartime built tankers of large type that such vessels were constructed of bad wartime steel and were, therefore, not capable of standing up to the work entailed by modern conditions.

Special Construction

IT is evident that the question of tanker construction is becoming increasingly complex, and a division into special types for special duties does not seem to be far distant. This was a point touched upon by A. D. R. Kelly in a paper lately read before the Institution of Engineers & Shipbuilders in Scotland, dealing with the piping installations of modern tankers. Mr. Kelly's idea was to emphasize the fact that pumping installations vary considerably with the different requirements of owners. Except on certain general broad principles, even the opinion of owners' superintendents differed. It is quite obvious that what suits one trade might not suit another, and an installation which might be suitable for vessels engaged in carrying only heavy oil certainly would not be suitable for benzine carriers.

Chartering:

IN spite of recent completions and trial trips the charter market remains uniformly depressed. Freight rates are still declining, and although there recently arose a slightly greater demand for tonnage, the rates were not good. American coasting has remained unchanged and there is very little news to report. A feature of recent chartering worth commenting on is the influx of motor vessels into the dirty oil trade.

Isherwood System

THE annual report relating to the progress of the Isherwood system of construction may be considered a barometer of the shipbuilding outlook, particularly tanker construction. Details of the report for the year ending December, 1930, indicate that Isherwood constructions continue to advance steadily. In spite

of the setback in placing new contracts for ships, during 1930, the longitudinal and bracketless designs secured a fair portion of the work available.

Starting in 1908 with six ships, with a deadweight carrying capacity aggregating 31,608 tons, the Isherwood system has reached a position by 1930 where the total of ships constructed or under construction, number 1,827 with an aggregate d.w.c. of 15,357,460 tons. Although contracts placed during 1930 naturally show a large decrease on the number of vessels ordered during 1929, the latter being an exceptionally good year for tankers, it must be remembered that a large percentage of orders were placed toward the end of 1929 for delivery in 1930 and 1931.

That Sir Joseph W. Isherwood & Co., Ltd. continues to maintain an important position among shipbuilders is clearly indicated by the fact that during 1930 two ships with a d.w.c. of 20,600 tons, six ships with a d.w.c. between 16,200 and 18,000 tons, ten ships with a d.w.c. between 14,750 and 15,500 tons, and eleven ships with a d.w.c. between 9,400 and 13,500 tons were completed.

Although suitable for all types of ships, the Isherwood and bracketless systems are widely adopted for tankers. No fewer than 988 of the 1,827 ships so constructed are oil tankers. Their d.w.c. aggregates 9,219,960 tons of the total of the 15,357,460 tons d.w.c. completed in 23 years. Two notable Isherwood ships were the G. HARRISON SMITH and the W. S. FARISH, built in the United States last year by the Federal Shipbuilding & Dry Dock Co., of Kearny, N. J. They are high-pressure steam turbine vessels. Also nine Diesel-driven tankers constructed by the Sun Shipbuilding and Dry Dock Co., of Chester, Pa., were built to the Isherwood system.

A. C. HARDY.

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Penn. State Oil Courses

CONVENIENTLY located in the geographical center of one of the large mineral, oil, and gas producing states, the School of Mines and Metallurgy of Pennsylvania State College is following an energetic program in an effort to serve the industries in which it offers training. Its service to these industries comes under three general heads: first, training young men for employment in the industry; second, research; and, third, extension work.

The school is composed of four departments: Geology, Mining, Metallurgy, and Ceramics. The Geology department offers two options, one consisting of General Geology and the other of Oil and Gas Production.

Started in 1891 by a State appropriation, the School has grown steadily until at present it has an enrollment of over 200. The list of graduates numbers over 700, many holding responsible positions in the oil industry.

Education of the undergraduates is carried on by field trips, summer camps, and laboratory work, as well as by formal lecture courses. Semi-technical meetings and inspection trips to the refineries and oil wells keep the students in close touch with actual conditions in the industry.

Seven advisory boards, composed of executives and scientists, enable the faculty to maintain contact with the industry. These boards serve the school by direction of study, research, and extension work; by furnishing summer employment, finding positions for graduates, and suggesting lecture courses; and by helping the school publicity and assisting in raising funds to carry on research work.

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Prolonging the Life of Tanks and Tankers

By H. Castle Fletcher

International Paint & Composition Co. Technical Manager

CORROSION means a great deal more to oil men today than it did fifty years ago. This is partly because the need for bulk storage and transportation of petroleum and its bi-products has increased enormously, and partly because the type of bi-product stored and carried also varies. It is now generally accepted that the carriage of light oils in tankers causes considerable deterioration and eventually necessitates the entire reconstruction of the center (tank) section of the ship. A prominent European shipping man pointed out, in a recent paper read before the Tanker Section of the Norwegian Shipowners Association, that this problem has become so acute that it is necessary in the interest of charter tanker owners to find a special paint capable of resisting such corrosion. The careful and detailed study of corrosion is a point which has been occupying the closest attention of at least one of the important companies engaged in the paint and composition side of the industry.

Of all the causes of corrosion, sulphur is undoubtedly the most serious, especially when water is present. This is a point where tank ships are at a disadvantage. They are obliged to take in fresh or salt water as ballast alternating with the oil cargo. Both are injurious in themselves, but when sulphur creeps into the problem there is the increased corrosive effect of the acids so formed. Sulphide of iron will cause electrolytic corrosion of the internal structure of the tanks and a solution of sodium chloride, provided by the seawater, will accelerate this destructive process. These, in brief, are the causes of the phenomenal destruction which has been going on in tankers until recently. Today it can be stated safely that the excessive destruction of oil carrying vessels by internal corrosion is a thing of the past. Modern science, through paint technologists has discovered a solution to this formidable problem.

There is on the market today a composition, applied like paint, which leaves in intimate contact with the structure a film which is inert to all petroleum derivatives; aromatic compounds such as benzol; in fact, any material likely to be carried as cargo in a tanker, such as whale oil, oleic acid, creosote oil, etc., and is at the same time resistant to both salt and fresh water. The value of this film as a rust inhibitor is clearly indicated by the fact that its water absorption is less than that of high class bituminous compositions. The protection will be more efficient than ordinary paint, subjected to the destructive influences of the atmosphere, because it is affected only by mechanical friction or the pounding of the liquid cargo.

U. S. Production Review

U. S. Production Review

	Daily Production bbl.	Daily to Stills bbl.	Gasoline Stocks bbl.	IMPORTS Daily Total bbl.	IMPORTS Gasoline %
Week Ending Feb. 14.....	2,130,258	2,211,300	42,859,000	206,714	16.9
Week Ending Feb. 21.....	2,158,784	2,270,400	43,608,000	200,714	11.3
Week Ending Feb. 28.....	2,104,900	2,266,100	44,792,000	297,000	17.6
Week Ending March 7.....	2,156,700	2,172,100	45,789,000	219,857	19.1

Underlined figures indicate improvement in statistical position—decrease in production, runs to stills, gasoline stocks or imports.

Crude Oil Prices.

THE Rusk-Gregg field of East Texas was primarily responsible for the weakened structure of crude oil prices. In this field original contracts have been made for deliveries at 35c to 40c per barrel, though at the moment of writing it is reported that the crude cannot be bought at 50c per barrel. Because the East Texas oil is of gravity the same as the Mid-Continent crudes, the prices paid have been fully 60c per barrel below Oklahoma-Kansas posted prices, and as the Rusk-Gregg field rapidly increased its production the Mid-Continent prices had to decline. The Stanolind Crude Oil Purchasing Co. (S. O. of Indiana) announced the new posted prices on March 4, and this reduction was followed by similar action on the part of other purchasing agencies.

New and Old Price Schedule

Gravity	March 4 1931	Nov. 1 1930	April 10 1930
Below 25.....	0.43	0.65	0.75
31 to 31.9.....	0.49	0.77	1.10
35 to 35.9.....	0.57	0.92	1.25½
40 to 40.9.....	0.67	1.07	1.43
44 and above....	0.67	1.07	1.57

The crude cuts of Mid-Continent area were followed in California, where the Union Oil Co. on March 7 announced a reduction averaging about 50c per barrel, and affecting 24 California fields. In Santa Fe Springs 21 to 21.9 gravity crude has been selling for 92c per barrel; the new schedule is 67c. Forty gravity crude has been selling for $1.78; the new price is 98c. Further comparable reductions probably will take place throughout the oil producing fields of the United States. Because the price cuts have been radical, additional re-adjustments are expected to occur during March, and prices will not be generally stabilized until April.

East Texas—Rusk-Gregg

WITH the continued rapid development of the three new East Texas fields (Joiner, Kilgore and Longview), and much additional data becoming available, it is apparent that the Rusk-Gregg fields will not have more than a very passing influence on the oil industry, regardless that by mid-March the area was averaging 78,000 bbl. per day. Indeed, certain factors seem to indicate that the boom will pass away as suddenly as it came.

Geologically a different interpretation is made at the present time. Instead of the purely shore line deposit, unrelated to any structural uplift, as originally conceived, it is believed that the sand was deposited on a long low anticlinal structure on the east edge of the main Sabine Uplift, and that later the minor uplifting caused the closed structure to be reduced to a terrace. Such conclusions are sustained by thinned intervals of sedimentary beds. This interpretation means that the Joiner, Kilgore, and Longview field will be of lesser magnitude than originally expected, but a more important fact is that it limits production to this particular structural feature, and makes further large extensions improbable, though additional smaller fields may, and probably will be discovered.

The present indications are that the total Rusk-Gregg producing area will be substantially one field about 30 miles long and 2 miles wide (38,400 acres), and that the average cumulative recovery per acre will not exceed 5,000 bbl., or a total of 200,000,000 bbl., though individual tracts may reach 30,000 bbl. per acre recovery. The unfavorable factors that warrant such conclusions are: (1) very low initial gas pressure, 450 to 500 lb. instead of the normally expected 1,200 lb.; (2) the rapid increase in temperature of oil when wells are allowed to flow open, from 75 deg. F. to 130 deg. F. in one day in the Arkansas Fuel Oil Co.'s No. 1 Lathrop, indicating water encroachment; (3) thin body of sand, averaging but 25 feet over the whole field, and (4) small porosity of the sand, which tests 18 per cent, compared with 25 per cent porosity in the similar sands of North Central Texas.

Figuring the cost of a completed and fully equipped oil well in Rusk-Gregg field at $31,000; the price of crude oil at 40c per barrel, and deducting ⅛th royalty, the operators must produce 100,000 bbl. per well to break even. Since, however, the flowing life of the wells has been demonstrated to be very brief, and since the mechanical lifting cost will be fully 20c per bbl., the production necessary to break even will be nearer to 175,000 bbl. per well, or 17,500 bbl. per acre, figuring on one well to 10 acres. As indicated above, the average recovery per acre is not expected to exceed 5,000 bbl. It therefore becomes apparent at once how desperate is the position of the smaller oprators, who average sometimes one well to but 5 acres. To make any profit at all a price of $1.00 per barrel should be prevailing in Rusk-Gregg producing fields. As the developments stand to day only the major companies with large blocks, and resulting wide spacing of wells will profit from operating in East Texas, and then only if they run the oil to their own refineries. The profit of any consequence will be made by concerns which are purchasing the 40 deg. Be crude oil at a ridiculously low price of 40 cents per barrel.

Recent Rusk-Gregg Developments

THE latest developments in the Rusk-Gregg counties include:

1. Increase of daily production to 75,000 bbl. per day, which at prevailing posted prices brings $28,000.

2. Increase in active operations and producing wells to 240, and a weekly increase of 40 new wells, indicating a total of about 350 by April 1, and about 500 by May 1. Total number of completed producing wells is about 75.

3. Small extensions of the three producing areas and their indicated interconnection.

4. Completion of a dry hole 9 miles south from Joiner field by the Capps-Smith and Anderson; this well has been considered favorably by operators and the dry hole resulted in an actual loss to interested operators of over $500,000, primarily lease depreciation.

5. Indicated unfavorable correlation

of M. Hammond No. 1 Hambie, 4 miles North from Longview field. Even if this well will produce, it is running sufficiently low to preclude further extension of production to the North.

6. Delay in completion of pipe lines into the area by the Humble and by the Magnolia Companies. Under the Texas law these pipe lines would have to take all oil offered, which, it was estimated, would give their owners more oil than they desired.

7. The Texas and Pacific Railroad, which runs through Gregg County, lowered its freight rates on oil from Longview to Shreveport to seven cents per hundred-weight, thus causing temporary postponement of pipe line construction by the Empire Co.'s subsidiary, the Arkansas Fuel Oil Co.

8. The Sinclair-Texas Pipe Line Co. is reported to be considering the construction of a pipe line from Rusk-Gregg fields to its Oklahoma trunk line at Oklahoma City, 265 miles, and also to Houston, where Sinclair Refining Co. operates a 60,000 bbl. refinery.

9. The Yaunt-Lee Oil Company has purchased a half interest in the discovery producer in the Lathrop field, and 2,500 acres in the heart of the pool, for $3,270,000, of which $1,270,000 was cash.

Texas Proration

THIS issue of WORLD PETROLEUM will have closed for press prior to the hearing on State-wide proration in Texas, called for March 23 by the State Corporation Commission. To be discussed is a proposal to bring the new Rusk and Gregg counties oil fields under proration for a new maximum limit beginning April 1. It is reported that independent operators and royalty owners will offer strong opposition to the plan. Meanwhile the allowable production in the Darst field has been reduced to 20,000 bbl. per day from 30,000 bbl.

Kansas Proration

DESPITE personal objection to the principle of the new State oil proration bill passed by the Kansas Legislature, Governor H. H. Woodring has signed the bill, as 90 per cent of the independent oil men in Kansas favor regulating powers. Governor Woodring is not able to reconcile restrictions on the production of natural resources in Kansas with free importation of oil. BASIL B. ZAVOICO.

THE FOREIGN OIL LEGION

EUGENE HOLMAN, assistant to the president, Creole Petroleum Corporation, sailed on March 7th aboard the S. S. SOUTHERN CROSS on a business trip to South America.

▼

J. B. HULL, drilling superintendent of the Jersey Standard's production subsidiary in Trinidad, recently arrived in New York on a short visit to the United States.

▼

RITTSON THOMAS, who for the last year has been field superintendent in the Mene Grande oil fields of the Venezuelan Oil Concessions, was recently transferred to the Cabimas camp.

▼

HOYT SHERMAN, assistant general agent in Venezuela for the Venezuela Gulf Oil Co., has been elected president of the new Gulf Terminal Club, which the company has just completed at its Belle Vista terminal. The new club is one of the finest ever built for any oil company in its operations abroad.

▼

SIR HENRI DETERDING, chief executive of the Royal Dutch Shell oil group, has purchased a farm at Goeschau, thirty miles south of Hamburg, Germany. Sir Henri was born in Holland, and knighted by the King of England.

▼

R. MEYER, until recently chief of construction at Royal Dutch-Shell's Curacao refinery is now at The Hague, Holland, in the position of Chief of the Construction Department for the N. V. De Bataafsche Petroleum Mij.

▼

VICTOR ANTONESCU, director of the Steaua Romana (Roumanian Star), Bucharest, Roumania, was in Paris recently attending the annual director's meeting of his company.

▼

THOMAS I. DICKSON, field superintendent at the Cabimas oil field of the Venezuelan Oil Concessions, has been transferred to the Côlon district.

▼

C. S. CARTER of the American Well Works Co. has been visiting the Venezuelan oil fields, demonstrating his company's electric pumping unit.

▼

HAROLD GOLDMAN recently returned to New York after two years in the South American oil fields locating oil well sites for the Jersey Standard.

▼

J. R. DALLERUP is now on a trip visiting practically every oil field in the world and will be away until 1932. He is representing Reed Roller Bit Company and Martin-Decker Corporation. Mail sent to Mr. Dallerup care of the American Consul, Singapore, Malay States, will reach him if despatched before April 1.

Mr. and Mrs. Dallerup examining proposed route of world tour with Mr. Martin and pilot

U. S. Soviet Russia Production Review

February	
Crude Production	11,141,900 bbl.
Runs to Stills	9,514,400 bbl.
No. Feet Drilled	147,935 ft.

Official Export Figures

COMPLETE details concerning the 34,695,000 bbls. of petroleum products exported from Russia during the fiscal year ending September 30, 1930, are now available to WORLD PETROLEUM readers. Shipments from Batoum and Touapse totaled 29,595,000 bbl. as follows:

Exports from Batoum and Touapse by Product

Product	Bbl.
Gasoline, ligroin and kerosene	14,137,500
Gasoil and Solar oil	3,247,500
Fuel oil and other heavy oils	10,687,500
Lubricating oil	1,522,500
Total	29,595,000

The balance of 5,100,000 bbl. was shipped from other Russian points.

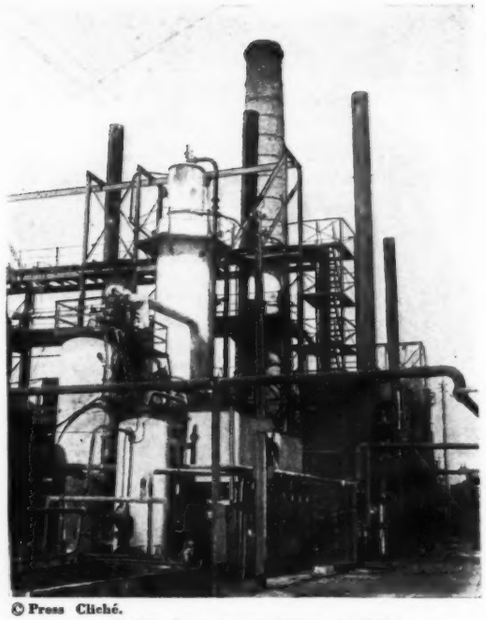
AN indication of the drive that the Soviets are making on the markets of other countries can be obtained from the following figures showing where these petroleum products went.

Russian Exports by Destination

Destination	Ports of Shipment: Batoum (bbl.)	Touapse (bbl.)	Other Places (bbl.)
England	5,347,500	1,875,000	.....
France	2,040,000	1,252,500	.....
Spain	1,410,000	930,000	.....
Italy	4,882,500	600,000	.....
Egypt	1,320,000	412,500	.....
Germany	2,887,500	210,000	.....
Belgium-Holland	960,000	210,000	.....
Turkey	817,500	487,500	.....
India	1,342,500	.....	.....
Other countries	1,837,500	772,500	5,100,000
Totals	22,845,000	6,750,000	5,100,000
Grand Total	34,695,000 bbls.		

Three Year Plan

THE command of the highest prerogative of Soviet Russia, to which reference was made in the February issue of WORLD PETROLEUM, has been followed by an order from the Government to revise the working plans of the oil industry in order to ensure of the scheduled 331,000,000 bbl. of crude oil being produced in 1933. Large scale activities are to be launched in 1931 with a view to bringing a number of new oil areas under production, apart from working new fields in the old oil areas.



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Stalin benzine refinery at Baku

Production Planned for 1933

(All Oil Trusts)

Old Oil Areas (Caucasus)

	bbl.
Azneft	145,000,000
Grozneft	86,000,000
Maikop	30,000,000

(Other Fields)

	bbl.
Embaneft	12,500,000
Sakhalin	11,500,000
Middle Asia	4,000,000
Turkman	2,500,000
Ural	800,000

New Areas

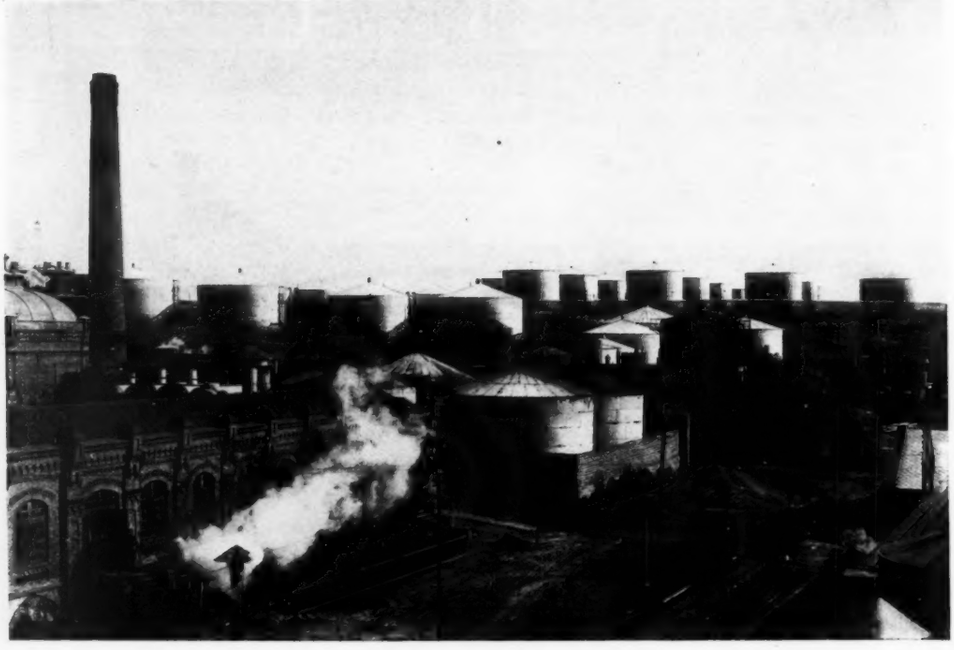
	bbl.
Georgia	4,800,000
Dagestan	2,200,000
Kubansk	9,000,000
Tierskaia	10,000,000
Benoe	12,500,000

TOTAL runs of crude to stills will amount to about 300,000,000 bbl., and the output of the chief refined products will consist of 100,000,000 bbl. of gasoline, 50,000,000 bbl. of kerosene, and 15,000,000 bbl. of lubricating oil. The major part of the 1933 quota will be supplied by Azneft, Russia's largest producing and refining oil trust.

Azneft's Production Program for 1931-33

	1931 (bbl.)	1932 (bbl.)	1933 (bbl.)
Gasoline	8,000,000	16,800,000	34,800,000
Kerosene	24,000,000	29,600,000	30,000,000
Lubricating Oil	6,650,000	9,100,000	9,500,000

IN order to attain these annual quotas, Azneft will have to increase its



"Black Town," in the Baku Oil Fields of Azerbaidzhan, in Transcaucasia

crude production to 95,000,000 bbl. in 1931; 120,000,000 bbl. in 1932; and 145,000,000 bbl. in 1933. The main producing areas of the Azneft are at present the Lenin group of fields, Shubani, Bibi Eibat, Bukhtha Bay, Bingadi, Isle of Artem, and Puta.

THE latest report of the Azneft shows that there is a gradual decline of production of light oil, and it is to be expected that the proportion of light oil may come down from the expected 71 per cent in 1931, to 63 per cent in 1932, and 59 per cent in 1933 unless measures are taken promptly to correct the shortcoming. It is also to be expected that the upper oil horizons of such fields as Surakhani, Bukhtha, and Bibi Eibat will be exhausted of their light oil content within a year or so, unless a rigid régime of gas conservation is introduced.

Methods of production in the Soviet oil fields are still open for improvement. Flooding of wells, repercussion vacuum methods, and an extensive use of air and gas lift have not been introduced as yet. A production report of the Azneft shows that of 450 wells working at present under compression only 25 wells are using gas lift, while the others are being operated under enormous waste.

It is expected that production of the Azneft crude known for its lubricating properties will fall off from 10,000,000 bbl. in 1931 to 8,000,000 bbl. in 1932 and 6,000,000 bbl. in 1933; measures are being taken, therefore, to produce lubricating oils from the heavier grades of Baku crude. For this purpose studies are being made of various refining and deep cracking methods, and research work is being done in the direction of hydrogenation.

Azneft Refinery Operation Plans

	1931 (barrels)	1932 (barrels)	1933 (barrels)
Runs to stills	90,000,000	116,000,000	136,000,000
Straight run gasoline	4,655,000	5,558,000	5,677,000
Crackg. gasl.	2,338,000	9,394,000	24,647,000
Kerosene	21,371,000	25,795,000	26,025,000
Machine oil	3,800,000	4,500,000	4,900,000
Cylinder oil	700,000	1,200,000	1,820,000
Motor oil	715,000	1,064,000	1,260,000
Bright stocks	280,000	840,000	840,000
Fuel oil	28,750,000	32,669,000	28,100,000

BADGER and Foster Wheeler vacuum stills have been recommended for the manufacture of lubricating oils from Baku heavy grades of crude, while Max Miller units will be used for treating Surakhani crude for the manufacture of bright stocks.

Azneft's Refinery Construction Program for 1933

Units and Annual Capacity	1931	1932	1933	Total
Pipe Stills (3,150,000 bbl.)	4	8	..	12
Pipe stills (4,950,000 bbl.)	..	..	5	5
Shell stills (9 batteries) (3,150,000 bbl.)	1	..	..	1
Bright stk. plants (300,000 bbl.)	1	2	..	3
Pipe stills lub. oil (1,500,000 bbl.)	1	1	..	2
Cracking units (1,125,000 bbl.)	4	27	58	89
Coke stills (150,000 bbl.)	24	36	174	224

Baku Oil Industrial Settlement

THE most outstanding project of all new construction planned by the Soviet oil industry is the erection of an oil industrial settlement near Baku which Azneft undertook some time ago. The project was presented to Azneft by the Baku branch of the Giproneft (State Institute for planning the oil industry of the U. S. S. R.). It was approved and representations made for an appropriation of about 92,000,000 roubles. The settlement will consist of 68 plants with all the necessary treating auxiliaries, storage tanks, etc., to be built on the waterfront near Baku. Survey work has been completed, and specifications for the tank farm, water supply, and steam economy are ready. Preliminary work started the beginning of this year.

This oil setlement will consist of ten kerosene-lubricating oil, Badger type, pipe stills with a total capacity of 15,000,000 bbl. per year; five Foster Wheeler type kerosene plants with a capacity of 15,000,000 bbl. a year; five Foster Wheeler type kerosene-lubricating oil units with a capacity of 22,125,000 bbl. per year (15,000 bbl. a day when refining up to 50 per cent) or 15,000,000 bbl. per year (10,000 bbl. a day when refining up to 80 per cent.) The total annual capacity of the twenty units will be between 42,000,000 bbl. and 48,650,000 bbl. Apart from the plants mentioned above 48 cracking units of Winkler Koch type with a total yearly capacity of 52,875,000 bbl. will be erected. There will be approximately 250 boilers, all of which will be of Lancashire type for working pressures of 6 and 10 Atm. with a total heating surface of 20,000 square meters. The treating plant division of the settlement will consist of twenty-six treating plants for straight run- and cracking gasoline, kerosene, and lubricating oil with a total treating capacity of 53,625,000 bbl. per year. About 470 tanks of various capacities will comprise the tank farm, with a total of 16,687,500 bbl. capacity. It is expected that the erection of the settlement will require about two years.

World Crude Oil Production Figures

(Official)

January, 1931 (Revised)

(Conversion Basis. 1 Ton = 7 bbl.)

Countries	Barrels
Total production	110,667,288
United States	65,991,000
All other countries	44,676,288
Venezuela (Estimate)	12,500,000
Russia and Sakhalin	12,072,900
Roumania	4,233,810
Dutch East Indies (Estimate)	3,226,854
Persia	3,201,156
Mexico	2,890,903
Colombia (Intl. Petroleum)	1,657,694
Peru	986,902
Trinidad	821,523
Argentine (Estimate)	780,000
India-British (Estimate)	583,333
Poland	390,600
§Sarawak	326,956
Japan and Taiwan (Estimate)	197,500
#Egypt	196,021
Canada	179,711
Ecuador	137,531
Germany	127,894
Iraq (Estimate)	100,000
Others (Estimate)	65,000

§ Sarawak: four weeks to Feb. 6.
# Egypt: five weeks to Feb. 6.
Where figures are not official, they are given as estimates.

February, 1931

(Conversion Basis. 1 Ton = 7 bbl.)

Countries	Barrels
Total Production	98,892,029
United States (A.P.I.)	59,600,000
All other countries	39,292,029
Russia & Sakhalin	11,141,900
Venezuela	9,806,034
Roumania	3,570,000
Dutch East Indies (Estimate)	3,225,000
Persia (Estimate)	3,200,000
Mexico	2,563,986
Colombia (Intl. Petroleum)	1,565,424
Peru	662,022
Trinidad	744,518
#Argentine (Estimate)	740,000
‡India-British (Estimate)	580,000
Poland	350,700
*Sarawak	231,090
Japan & Taiwan (Estimate)	195,000
Canada (Estimate)	175,000
Egypt (Anglo-Egyptian)	158,210
Ecuador	120,145
Iraq (Estimate)	100,000
Germany	98,000
Others	65,000

‡ India-British official total production for 1930 = 6,936,315 barrels.
* Sarawak: four weeks to March 6.
# Argentine official total for 1930 = 9,001,672 barrels.

FINANCE

New York

DURING the period covered by this month's report the general trend in the stock market was downward, following the rather substantial advance recorded from the December lows to the middle of February. In the oil division weakness was accentuated by further price cutting in both gasoline and crude, and the continued uncertainty in the outlook for proration in the Mid-Continent. The fate of the proration expected to be effected for the new flush production from East Texas, which will come on the market in excessive volume in the coming month or two if not checked by co-operative action, is in doubt. Gasoline stocks are already well above the 45,000,000 bbl. mark and the Bureau of Mines report for March may perhaps show them close to 50,000,000 bbl. as of April 1. This would indicate only partial success by refineries in keeping stocks to reasonable proportions. If consumption fails to show normal expansion in the coming months in comparison with last year, it will be almost impossible for the gasoline price structure to show any material improvement. These factors, together with release of comparatively unfavorable earnings reports for 1930, resulted in many of the oil shares declining to within striking distance of their 1930 lows.

ANNUAL report of The Texas Corporation revealed gross earnings of $188,812,427, a decline of 11.5 per cent from 1929, from which there was available for the capital stock $15,073,303, a decline of 69 per cent and materially less than the $20,605,982 net of 1927, which was the last previous year of sharply declining oil prices necessitating large inventory losses. Earnings equal to $1.53 per share on the shares outstanding at the close of the year were only slightly more than half the dividend requirements at the $3 rate and a deficit, after dividends of $14,479,908, was carried to surplus. The striking feature of the balance sheet was the strong financial position with total current assets of $229,926,400 in ratio of 7.1 to 1 to total current liabilities, leaving net working capital of $197,693,509 including cash, securities and notes receivable of $69,452,092. Cash and marketable securities alone were equal to $5 a share on the 9,581,151 shares outstanding. Net property account was $324,601,643, an increase of 4 per cent during the year, after deduction of reserves for depreciation, depletion and amortization of $235,345,944. Although current earnings are undoubtedly continuing below dividend requirements, the strong financial position would make possible continuance of payments at the $3 rate, and the management will naturally desire to do this for the sake of the 75,000 stockholders to many of whom the dividends are an important source of income. In finally determining dividend policy current trends and developments in the coming few months will receive close attention.

EARNINGS of Venezuelan Petroleum Company, a subsidiary of Sinclair Consolidated Oil, were equal to 14 cents a share in 1930 in comparison with 18 cents in 1929, based on the 2,000,000 shares of $5 par capital stock outstanding. Dividend payments in 1930 totaled $100,000 as against $400,000 the previous year, and balance of $191,129 was transferred to surplus in contrast with the 1929 deficit after dividends of $28,370. The company closed the year in strong financial condition and showed a slight increase in total assets.

STANDARD OIL COMPANY of California reported 1930 net income after all charges of $37,675,300, equal to $2.87 a share on the 13,102,900 shares outstanding at the close of the year. This represents a decline of 19 per cent from the 1929 net profit of $46,633,490, which was equal to $3.63 a share on a somewhat smaller number of shares. The moderate coverage of the $2.50 dividend rate may be considered very satisfactory in view of the unfavorable conditions in the industry. Financial position at the end of the year was good with cash and equivalent of about $15,700,000 equal to substantially more than total current liabilities.

New York Stock Prices

1931 High	1931 Low	Current Div. $ per Annum	Stock	February 16 to March 14 Sales (Shares)	First	High	Low	Last	Net Change[1]
23⅝	18	1.00	Atlantic Refining (25)	132,000	22¾	23⅝	18⅜	19⅞	— 2⅝
14½	11¼	1.00	Barnsdall "A" (25)	86,500	13½	14½	11⅜	12	— 1⅝
3⅛	1½	....	Colon Oil (No)	16,100	2¼	3⅛	2¼	2½	+ ¼
12	9⅛	....	Continental Oil (No)	121,700	10⅞	11⅞	9⅛	9⅞	— ⅞
3½	3	....	Creole Petroleum (No)	19,500	3⅜	3½	3	3	— ¼
75½	63¾	1.50	Gulf Oil Corp. (25)	29,700	69⅞	71⅞	63¾	64½	— 5½
72	55½	2.00	Humble Oil & Ref. (25)	13,400	66½	68	55½	56	—12
18¼	15	†1.00	Imperial Oil, Ltd. (No)	15,600	17¼	17½	15	15⅜	— 1⅝
4⅝	3⅝	....	Indian Refining (10)	9,800	4¼	4¼	3⅝	3⅜	— ¾
15½	12⅛	1.00	International Petr. (No)	44,600	14¾	14⅝	12½	13	— 1¼
19¾	10⅝	....	Mexican Seaboard (No)	289,800	17⅛	19¾	15¼	17	— ⅜
19½	14	2.00	Ohio Oil (No)	94,100	17½	17⅞	14	15⅛	— 2¾
36½	32	....	Pan Amer. P. & T. B. (50)	900	34	35½	34	35½	+ ⅜
16⅝	10⅞	....	Phillips Petr. (No)	282,200	14½	15⅜	10⅞	11⅜	— 3⅛
20¾	12¾	2.00	Prairie Oil & Gas (25)	52,000	15⅝	20⅜	14⅝	15	.....
11⅞	8¾	....	Pure Oil (25)	39,000	10½	10⅝	8⅞	9⅜	— 1⅝
6⅛	2¾	....	Richfield Oil (No)	103,300	4⅞	5⅛	4⅜	4⅜	— ⅝
42⅜	37¼	*3.20	Royal Dutch (N.Y.)(13⅜)	18,600	41⅜	41¾	37¼	37¾	— 4
10¼	7⅜	....	Shell Union (No)	83,000	9½	10	7⅜	8	— 1¾
15⅞	10¼	1.00	Sinclair Consol. (No)	374,600	12⅞	15⅞	12¼	13¼	+ ⅜
12⅞	8½	....	Skelly Oil (25)	36,400	10½	10¾	8⅝	8⅞	— 1⅝
51¾	45	*2.50	Standard Oil of Calif. (No)	92,700	49⅜	51	45	45⅜	— 4⅝
38½	31⅝	2.00	Standard Oil (Ind.)(25)	130,600	34⅞	35½	31⅝	31⅜	— 3⅛
23⅜	20⅜	†1.80	Standard Oil (Ky.)(10)	22,900	23⅜	23⅜	21½	22	— 1¼
52½	44⅝	†2.00	Standard Oil (N.J.)(25)	417,500	50¼	52½	44⅜	46	— 4¼
26	21⅞	1.60	Standard Oil of N. Y. (25)	125,000	25½	25¾	21⅞	22⅞	— 2⅜
45¼	39½	§1.00	Sun Oil (No)	3,700	44¼	45¼	41¼	41½	— 3½
36¼	30	3.00	Texas Corp. (25)	174,300	34	35½	30	30⅞	— 3¼
9	6½	0.60	Tide Water Assoc. (No)	62,100	8	8¾	7	7¼	— ¾
26⅜	20¾	‡2.00	Union Oil of Calif. (25)	37,400	25⅜	25⅞	20¾	22	— 3½
69¾	52⅝	4.00	Vacuum Oil (25)	44,500	64½	67	54½	55⅞	— 9⅛
1⅞	⅞	....	Venezuelan Petr. (5)	12,600	1	1⅛	1	1⅛	+ ⅛

[1] Since close of last month's table. * Paid last year—no regular rate. † Including extras. ‡ Plus 4% in stock. § Plus 9% in stock. ★ Plus 2% in stock.

DEFICIT of Phillips Petroleum in the fourth quarter of last year was sufficient to reduce the profit of $2.28 a share reported for the first nine months to the equivalent of 71 cents a share on the 4,279,982 shares outstanding at the end of the year. The 4-to-1 50-cent quarterly dividend is being omitted.

CONSOLIDATED net income of Tide Water Associated Oil for 1930 was $8,750,914, or 76 cents a share, in comparison with $14,000,688, or $1.73 a share, earned in 1929. The two 30-cent dividends paid to common stockholders during 1930 had been declared in December, 1929, and were charged against profits of that year. Thus there was a balance for 1930 after preferred dividends to add to surplus of $4,353,844. Cash and equivalent of $15,400,000 was substantially more than total current liabilities, and was equal to approximately $2.70 per share of common.

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Paris, March

THE Paris stock market displayed a decidedly better tone during the first two weeks of February, and most of the oil shares recovered several points. This improvement was only temporary, however, and they have since lost ground.

Although the political situation in France seems to be stabilized for the time being, transactions on the Bourse remain timid. Many adverse conditions have to be contended with; primarily the international situation which shows little or no improvement, and secondarily the depressing effect of the prolonged inquiry held by the Parliamentary Commission upon the affairs of the Oustric Bank.

Witnesses of every kind and description have been called before it: political men, servants of the State, bank employees, business men and publicists. They have all been submitted to the closest examination, which might almost be termed "inquisitorial." The immediate result of this enquiry has been to reveal to the public the many artifices which Oustric and others have employed to accomplish their business combines.

IT is not to be wondered at that the French public now regards most of the business concerns, good or bad, and even some of the banks with a certain amount of diffidence, one might even say, suspicion. In consideration of these facts, to which must be added also the difficulties with which the petroleum industry now has to contend, it is not surprising that there is no great confidence and that oil shares are more or less abandoned.

In a few weeks all the French oil companies will commence to publish their balance sheets for 1930. It is generally expected that except for a few rare cases, the financial results will be the worst which have been obtained since the great war.

One new feature of the Paris Bourse is that the number of transactions which now take place are recorded every day. This has never been done in the past with the result that the exact volume of business could never be ascertained.

THE industrial results obtained by the Societe Colombia for 1930 appear to be excellent, and the company's share whose par value is 500 lei (roughly Frs. 76, or $3.00) are now quoted around Frs. 100. — in Paris. Production amounted to 2,407,975 bbl. last year against 1,200,416 bbl. in 1929. The capacity of Colombia's refineries has been increased by the addition of some cracking units, and its means of distribution and exportation have been developed. These improvements would appear to justify the hope that a good dividend should be distributed at this time. This, however, is not the case.

Depression in Roumania during 1930 was such, and prices were so low that the profits made by Colombia will probably not exceed 30,000,000 lei ($200,000). It is rumored they are to be carried forward into 1931.

It is more than probable that a large number of the other Roumanian companies will find themselves in a similar situation when the time comes to announce their financial results, and that the position will not improve this year unless the Roumanian Government takes a firm stand and forces companies operating there to come to a decisive agreement to curtail their production.

E. J. ANDRE.

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London, March

WITH little more than two months of the current year elapsed, many oil shares have established low levels considerably under the worst touched in 1930. The market has been unable to absorb any considerable volume of selling. Most of the little support given came from Paris and Amsterdam, and was concentrated mainly on Shells, Royal Dutch, and Mexican and Canadian Eagles. At the close of February, the Continent turned a seller, and overseas realizations have since been added to other adverse market factors, including the cut in British prices for motor spirit at the beginning of March. Share prices started falling before the petrol price reduction was actually announced, the market having got wind that a price cut was in prospect. A natural upward reaction has since taken place, but it shows no sign of going very far.

NOBODY in the Market was surprised at the cut of 2d (4 cents) per Imperial gallon in wholesale and retail prices of motor spirit. In view of the lower basis of world prices and easier freights, the possibility of lower petrol prices in this country had been discussed for several weeks before it became a definite market influence. The latest petrol price decline, following the similar adjustment made in September means that popular brands have come down from 1s. 6½d.

Paris Bourse Prices

1931			Feb. 1 to Feb. 28				
Div.	Par	Share	First	High	Low	Last	Change
50 lei	500 lei	Astra Romana	131	155	125	126	— 5
....	500 lei	Colombia	91	127	91	103	+12
50 lei	500 lei	Concordia	89	106	84	84	— 5
....	500 Fr.	Cdré. Gal des Pétroles act	....	....	....	....	....
....	....	Cdré. Gal des Pétroles parts	1060	1600	1060	....	....
....	500 Fr.	Franco Pol Pétroles act	....	110	80	89	....
....	....	Franco Pol. Pétroles parts	....	395	360	....	....
1 $	10 $	Franco Wyoming	360	395	360	395	+35
20 Fr.	500 Fr.	S. G. des Huiles de Pétroles act	384	427	384	412	+28
....	....	" " parts	141	157	139	141	....
....	500 Fr.	C. Française des Pétroles	....	....	....	....	....
50 Fr.	500 Fr.	C. Industrielle des pétroles	860	960	860	880	+20
65 Fr.	500 Fr.	Lille Bonnières Colombes prio	965	1010	965	1005	+40
40 Fr.	500 Fr.	" " ord	640	690	640	660	+20
....	500 Fr.	Malopolska act	60	76	60	69	+ 9
....	....	Malopolska parts	425	524	330	452	+27
....	....	Mexican Eagle	60	73	60	....	....
17.50	250 Fr.	Omnium Inter. des Pétroles	131	195	131	135	+ 4
50 Fr.	500 Fr.	Péchelbronn	815	848	810	810	— 5
60 F.B.	500 F.B.	Pétrofina	571	625	571	590	+19
240 Fl.	1000 Fl.	Royal Dutch	30900	33000	30825	30825	—75
24 Fl.	100 Fl.	" "	3115	3330	3145	3140	+25
5 sh.	1 £	Shell	471	488	449	446	—25
25 Fr.	500 Fr.	Steaua Française	152	225	152	209	+54

(37 cents) to 1s. 2½d. (29 cents) per gallon within six months. Compared with those in other countries, however, British prices are still favorable to producers and distributors. Although the current period of the year should see the beginning of a larger consumption of petrol, many cuts in selling prices have been made in the spring during recent years. It is being rumored already that this year the consumer will be prevented by increased taxation from enjoying the benefit of cheaper costs for more than a few weeks. It is possible that in his search for new revenue, the Chancellor of the Exchequer may increase the petrol tax, at present 4d. (8 cents) per gallon, which is included in the selling price. But any move to impose a fresh duty on motor spirit used for commercial transport might bring serious opposition on the ground that it would hinder trade development.

DISCUSSIONS of a possible increase in taxes on motor spirit probably had their genesis in the recent announcements by the Indian and Egyptian Governments of higher duties on petroleum products. Both these developments have had their influence on the oil share market during the past month. The increase in the Indian duty was a "bear point" for several of the leading companies, which import a considerable amount of kerosene, as well as petrol, into the Dependency. A higher tariff in Egypt was responsible for the rise in Anglo-Egyptian shares which provided one of the few exceptions to the downward tendency of quotations.

ACCOUNTS of London and Thames Haven Oil Wharves indicate that if 1930 was a lean year for oil producers, it could provide excellent results for concerns engaged in handling petroleum products. The company does not deal in any of the products it handles, deriving its income from storage and refining charges and from its investments. Net profit for 1930 was £221,963, compared with £188,737 for 1929 and £152,487, for 1928. The dividend remained at 15 per cent free of Income Tax, but the undivided surplus increased £31,583; or from £114,386 to £145,969.

THAT British investors no longer regard the shares of oil producing companies with the confidence shown a few years ago is evident from the high yields obtainable on the leading shares quoted in London. The following table compares the yields offered by four leading shares on the first business day of March with the corresponding investment returns at the beginning of 1929.

	Approximate Yield Jan. 2, 1929 (per cent)	Approximate Yield Mar. 2, 1931 (per cent)
Anglo-Persian	1⅜	9¼
Burmah	4¼	9½
Shell Transport	4¼ (Tax Free)	7½ (Tax Free)
Royal Dutch	5¼	8¼

Up to the present there has been no indication of reduced dividends on any of the shares included above. Each of the companies concerned presented good results in its last annual report, and has maintained its interim dividend at the previous rate. In view of the general depression in the petroleum industry, however, the market is not over-sanguine regarding results for 1931, or prices would stand at a higher level.

ALEC. H. DAY.

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Belgium

THE annual report and balance sheet of Compagnie Financière Belge des Pétroles, S. A., for the year ending December 31, 1930, prepared for submission at the meeting of the stockholders to be held on May 8, next, reflects a continuance of the growth and prosperity which the company has enjoyed since its inception in 1920. The consolidated balance sheet shows total assets of 415,000,000 Belgian francs, of which 300,000,000 is capital and 115,000,000 represents reserves. Gross earnings during the year were 54,765,185.39 francs; after adding to this sum the surplus carried over from 1929 and deducting general expense, taxes, and amortization there is left a net balance for the year of 50,821,385.88 francs. This allows the company to declare a net dividend of 60 francs per share on its capital of 300,000,000 francs (as against the same dividend on a capital of 200,000,000 in 1929) and to carry forward a surplus of 10,312,671.75 francs.

The Company's principal subsidiaries continue to exhibit a healthy condition. After making liberal deductions for amortization and for reserves, Purfina S. A. is able to pay a gross dividend of 15 instead of 12 per cent as last year. Petrofina Francaise which has a license to import 2,250,000 bbl. of distillate, increases its dividend this year from 6 to 10 per cent; the N. V. Nederlandsche Petroleum Maatschopij "Purfina" this year pays 8 instead of 7 per cent, and the Societe Anonyme des Petroles au Congo will continue its dividend of 8 per cent. Work on the Raffinerie de Petrol du Nord at Dunkirk, which will handle about 975,000 bbl. a year, is being pushed to completion. The Company's Roumanian oil subsidiary, "Concordia," has increased its capital to 650,000,000 lei to acquire other properties. The storage and retailing facilities of the Hungarian, Greek, Bulgarian and Italian subsidiaries, and in the Congo, are being augmented. The Company's Roumanian coal subsidiary, Creditul Carbonifer, has had to face reduced purchases by the Roumanian railroads and a general falling off of coal prices.

London Stock Exchange Prices

1931 High	1931 Low	Last Year's Div. % per Ann.	Share	February 7 to March 7, 1931 First	High	Low	Last	Change
9/16	11/32	3½	Anglo-Ecuadorian	9/16	9/16	15/32	15/32	— 1/32
2⅜	1 13/16	22½	Anglo-Egyptian "B"	2 1/16	2⅛	2 1/16	2¼	+ 1/16
2 13/16	2 1/32	20	Anglo-Persian	2 23/32	2 25/32	2 5/32	2 5/16	— 13/32
5/8	13/32	25	Apex Trinidad (5s.)	9/16	9/16	15/32	17/32	— 1/32
11/32	15/32	....	Attock	7/8	7/8	29/32	29/32	— 1/32
5/16	7/32	12½	Brit. Borneo (10s.)	5/16	5/16	9/32	5/16	.....
7/32	5/16	‡ 6¾	Brit. Burmah (8s.)	7/32	7/32	3/16	3/16	— 1/32
3/32	1/16	....	Brit. Controlled ($5)	1/16	1/16	1/16	1/16	.....
2/16	5/32	....	Brit. Controlled Prefd. ($5)	5/32	5/32	5/32	5/32	.....
3⅝	3 1/16	30	Burmah	3 17/32	3 9/16	3 1/16	3 5/16	— 7/32
7/16	5/16	12c.	Canadian Eagle (No par)	7/16	7/16	13/32	7/16	.....
11/16	21/32	....	Creole Petroleum (No par)	21/32	21/32	21/32	21/32	.....
5/32	3/16	....	Kern River (10s.)	5/32	5/32	3/16	3/16	— 1/32
1⅛	1¼	12½	Lobitos	1 13/32	1 7/16	1¼	1¼	— 9/32
17/32	3/16	6	Mexican Eagle ($4 Mex.)	1/2	17/32	7/16	13/32	— 1/32
36½	33½	....	Pan American "B" ($50)	34	35½	33½	33½	— ½
3/16	5/16	5	Phoenix	3/16	3/16	5/16†	5/16†	— 1/16
26 5/16	23⅜	24	Royal Dutch (fl. 100)	25¼	26 5/16	24¼	24¾	— 3/8
3 27/32	3 5/16	‡25	Shell Transport	3 25/32	3 27/32	3 5/16	3 7/16	— 11/32
9/32	7/32	4	Steaua Romana	9/32	9/32	7/32	7/32	— 1/16
1 15/32	1⅜	7½	Trinidad Leasehold	1 31/32	1 31/32	1⅜	1⅜	— 7/32
9/32	¼	....	Untd. Brit. of Trinidad (6s.8d.)	9/32	9/32	¼	9/32	.....
1¾	1½	20	Venezuelan Oil Concessions	1 17/32	1¾	1 17/32	1¾	+7/32

Nominal value of shares £1 unless otherwise indicated by bracketed figures.
‡ Denotes tax-free dividend. † Denotes "ex-dividend" price.
c. Denotes cents per share.

New Equipment and Engineering Information

Turbo-Mixers

The new catalog of the Turbo-Mixer Corp., New York, describes their mixing equipment for rapidly producing efficient mixing of immiscible liquids, such as acids and oil, in oil refining.

Sullivan "50" Drill

The "Type 50" drill of the Sullivan Machinery Company, has been developed for unusually deep structure test drilling; or for shallow wildcatting. Some operators may wish to use it for shallow production work, and it can be employed for that purpose, using any ordinary rotary fittings, bits, etc., with the additional ability of substituting a core bit when it is desired to take core.

The "Type 50" outfit resembles the well known "Type 40" structure rig except that it is larger and heavier throughout. While space is provided for mounting a circulating pump on the truck, none is ordinarily supplied, as it is considered that a separate pumping unit will generally be used for circulation with this outfit.

The hydraulic cylinder has a travel or run of 18 inches, the same as the "40" but the area of the hydraulic piston is 104.5 square inches, compared with 47.5 square inches for the "40." The hydraulic cylinder is arranged to be operated by oil on a closed circuit, and a special rotary pump is employed in connection with the reservoir tank beneath the drill for the purpose, the oil being used over again. The pump can be thrown in or out of action by means of a clutch. This hydraulically controlled feed makes it possible to exert great downward pressure on the bit when starting a hole, and to control the amount of weight put on the bit with the greatest exactitude.

The Copeland Pipe Cutter

Pipe cutting and threading for jobs in the field usually is done by hand at the expense of much time and hard labor. A bright superintendent in Oklahoma found a way to save both labor and time in the manner illustrated in the picture.

The regular hub cap on the right rear wheel was removed and one with a projected socket was improvised. The socket with a driving bar about six feet long had two otherwise useless truck universal joints on it. The other end of the driving bar has a small square socket to fit over the ratchet square on the dies. Two "horses" the same height as the truck hub completed the outfit.

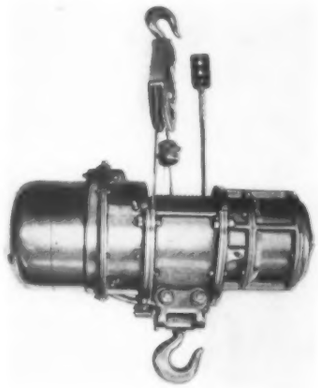
In threading, the die was placed on the pipe and connected to the truck by the driving bar. The jacked-up truck wheel did the rest. When the thread was cut, the truck was put in reverse and the die backed off.

For cutting, a socket was slipped over the end of the pipe and the driving bar used to connect to the truck wheel. The ordinary pipe cutter is placed on the pipe and the long handle hooked over the pipe to the cutter handle. The truck turns the pipe and as it is turned, an operator feeds in on the cutter.

According to Shell Globe a cut and thread can be made in 4 to 6-inch pipe in eight to ten minutes with this equipment. The time required to do it by the ordinary method is from 45 minutes to over an hour.

New Electric Hoist

The new Wright Type W Electric Hoist is built for installations where high operating speeds, economical operation, and low-cost maintenance are first essentials. In order to obtain high speeds plus efficient operation, the motors are of a liberal size and are designed especially for this type of hoist. Low-cost maintenance is obtained by correct design, extremely simple construction, and the use of the highest grades of materials such as: alloy steel shafts, drop-forged, heat-treated gears and pinions, and Tru-Lay preformed cable.



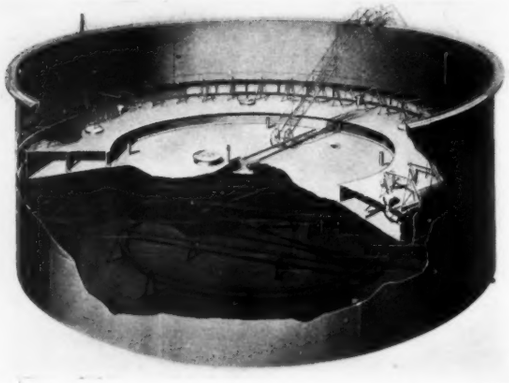
The hoists are designed for different types of suspensions. They are furnished with either push button or pendant rope control at the same price. The motors and controls are fully enclosed, dust proof and weather proof, so that the hoists are suited for both indoor and outdoor installations.

Welding Competition

The Lincoln Electric Company of Cleveland, Ohio, is offering a second series of $17,500 in prizes, ranging from $7,500 to $100 each, for descriptions of a useful machine, structure, or building in the construction of which electric welding has played an essential part. The competition will be judged by the electrical engineering department of Ohio State University. The first of these competitions was offered in 1927 and brought out a number of papers sufficient to make a sizable book.

Arc Welding Supplies

Lincoln Electric Welding Company, Cleveland, specialists in arc welding equipment, have out a new catalog describing their arc welding supplies with special reference to their "Fleetweld" process.



New Type of Floating Roof

THE Chicago Bridge & Iron Works is now building a new pontoon type of Wiggins Floating Roof in addition to the regular standard open deck type of floating roof. The principle of the new design is essentially the same as the open deck type, except that the pontoon feature has been added.

As shown in the accompanying cut-away illustration, the outer edge of the deck is built in the form of a continuous annular pontoon. This continuous section is divided at regular intervals by bulkheads which form water tight compartments. The sections, each of which acts as an individual pontoon, make the deck practically non-sinkable. The principal advantage of the pontoon construction is that it provides insulation for the roof where insulation is most valuable—at the seal which closes the space between the deck and the tank shell. Temperature readings on installations show that the temperature throughout the depth of the seal is relatively uniform and is materially lower at the hottest part of the day than if the insulation were not provided. The new design uses the standard Wiggins seal which consists of a ring of shoes that form a long sliding contact with the tank shell. The shoes are joined to the deck with a flexible material which allows the seal to expand or contract.

Acid Plants for Refineries

THE Chemical Construction Co., Charlotte, N. C., have published a description of the contact sulphuric acid plants they are offering to oil refineries. Two of these plants, using the simple and economical vanadium catalytic mass, are in operation and three more are under construction. The company is confident that before long all large refineries will be making their own sulphuric acid, in some cases from waste hydrogen sulphide gas produced in their purification processes.

Cleaning Oil Tanks

A TOUGH job in tank cleaning and how it was accomplished is described in a circular issued by the Turco Products Co. On a California tank farm several 134,000 bbl. tanks had been used for storing residuum and were needed for white products. Ordinary cleaning methods would have proved too difficult and expensive, but the job was done at a cost of much less than $1,000 per tank, as follows: A demountable scaffold and a solution-tank with pumps and hose lines were introduced into the tank; the scaffold was erected so that a workman could play on the sides and roof with the hose; a dyke of sand was built on the floor of the tank around scaffold; a hot solution of Turco-Petmusol was prepared in the tank and the washing down was begun. The residuum melted away like rotten ice under a stream of hot water; the dirty liquid was drained outside where it had a chance to cool and allow the heavy particles to settle out, the oil being skimmed off the surface. The cleaning fluid thus purified was returned to the solution tank to be heated and used over again. There being no noxious or inflammable fumes the crews were able to work regular 8-hour shifts in complete safety.

New Welding Blowpipe

AN improved sheet metal blowpipe, type W-107, designed for light welding work of all kinds, has been added to the Prest-O-Weld line by the Linde Air Products Company. The new blowpipe operates on the medium pressure principle. The valves are easily adjusted; the weight is only 10 ounces and the balance is perfect. Six tips of different sizes provide for a considerable range of applications.

New Oil Well Pumping Units

A NEW line of Westinghouse-Nuttall electric oil well pumping units, designated as the OP-300 line and comprising several ratings, are said to be the world's first oil well pumping equipments to embody the motor, control, and gear in one complete, integral, weatherproof unit that may be set on a foundation without a special bedplate, ready for immediate pumping after connecting only three leads to the power supply, joining the polished rod to the hanger on the beam. The motor is reduced to its bare elements of rotor and primary core with coils; the bearings, brackets, frame, shaft and couplings are eliminated.

These units are for pumping service only; they are applicable in any field where the economics of local conditions dictate the use of portable cleaning and pulling equipment. The illustration shows one of these units and its mechanical parts as installed at a well in Oklahoma.

Los Angeles Companies Consolidate

ANNOUNCEMENT has been made of the consolidation of the Los Angeles Pump & Supply Company and the California Manufacturing & Engineering Company under the name of Calmec Manufacturing Company, Ltd., with general offices and plant located at 5817 Riverside, Los Angeles. T. J. Crompton, an oil field operator and former executive of one of the major oil companies of California, is president.

Gas Pressure Regulation

"PIONEERS in Gas Pressure Regulation" is the title of a handsome and profusely illustrated catalog issued by the Wilgus Manufacturing Company, Los Angeles, whose line includes reducing, back pressure, gas fuel, vacuum, and differential regulators; pump and compressor governors, motor valves; gas lift controls and balanced lever valves.

Kerosene Tested Fittings

THE large new catalog of the Kerotest Manufacturing Company, Pittsburgh, is filled with descriptions of valves and fittings designed and fabricated with special reference to the needs of oil men. "Kerotest" means "kerosene tested"; all these fittings are subjected to hydraulic tests in which kerosene is the test liquid.

Fluid Level Indicator

J. H. BUNNELL & CO., INC., New York, have issued an illustrated bulletin describing the MacCready fluid indicator for remote gauging of levels in oil tanks, etc.